

SPR1100 Stream Processor

Software Version 6.7.x (and later)

REFERENCE GUIDE





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Contents

Chapter 1: Introduction

This chapter identifies the equipment versions covered by this manual, describes the purpose of the equipment in a typical system and lists the available options.

Chapter 2: Installing the Equipment

This chapter details the preparation and installation of the equipment including **important safety information**. It also provides pin-out details for the external connectors.

Chapter 3: Getting Started

This chapter provides a guide to powering up the unit and setting up the IP address.

Chapter 4: Front Panel Control

This chapter describes the front panel display menus and options and details any operating procedures.

Chapter 5: Web GUI Configuration

This chapter provides the configuration of the unit using the Web Graphical User Interface.

Chapter 6: Stream Processing and Networking

This chapter describes the principles and techniques used in the design of the equipment to aid in understanding its operation and function.

Chapter 7: Options, Licensing and Upgrades

This chapter provides details of option cards that may be fitted to this equipment.

Chapter 8: Preventive Maintenance and Fault-finding

This chapter details routine maintenance tasks, servicing advice and information regarding warranty and maintenance. It also lists error and error messages that may occur and recommends the action to be taken.

Annex A: Glossary

Annex B: Technical Specification

Annex C: Audio Coding Standards

Annex D: Dolby Metadata Presets

Annex E: Alarms List

Annex F: Automatic Loudness Control (ALC)

Introduction

This Reference Guide provides instructions and information for the installation, operation of the SPR1100 Stream Processor.

This Reference Guide should be kept in a safe place for reference for the life of the equipment. It is not intended that this Reference Guide will be amended by the issue of individual pages. Any revision will be by a complete reissue. Further copies of this Reference Guide can be ordered from the address listed in *Customer Services*. If passing the equipment to a third party, also pass the relevant documentation.

Revision History

Issues of this Reference Guide are listed below:

Issue	Date	Software Version	Comments
A	May 2013	6.7.x	Initial release. Converted from CHM Robohelp help file: 1553-FGC 101 1400 Uen A.
B	July 2013	6.7.x	Rename Reflex.

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Follow Instructions

All operating and use instructions should be followed.

Retain Instructions

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Warning!

Warnings give information which, if strictly observed, will prevent personal injury or death, or damage to property or the environment. They are highlighted for emphasis, as in this example, and are placed immediately preceding the point at which the reader requires them.



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Note: Notes provide supplementary information. They are highlighted for emphasis, as in this example, and are placed immediately after the relevant text.

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Return of Equipment

If you need to return equipment for repair please contact your local Ericsson Customer Services Department.
Please refer to the Customer Services Contact Information on Page vi

You will then be directed to return the faulty equipment to a repair centre with the appropriate facilities for that equipment. A tracking number will be issued that should be used if you need to enquire about the progress of the repair. The equipment should be properly packed and the tracking number should be clearly marked on the outside of the packaging.

Technical Publications

If you need to contact Ericsson Technical Publications regarding this publication, e-mail: tvtechpubs@ericsson.com.

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Introduction

Chapter 1

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1.1 Introduction

1.1.1 Who Should Use this Reference Guide

This Reference Guide is written for operators / users of the Ericsson SPR1100 Stream Processor. It describes the unit's functions and operation. The Reference Guide is written to assist in the installation and day-to-day care and operation of the unit. Maintenance information requiring the covers to be removed is not included.



Warning!

Do not remove the covers of this equipment. Hazardous voltages are present within this equipment and may be exposed if the covers are removed. Only Ericsson television trained and approved service engineers are permitted to service this equipment.



Caution!

Unauthorized maintenance or the use of non-approved replacements may affect the equipment specification and invalidate any warranties.

1.1.2 Software Version

This Reference Guide covers the functions of software **version 6.7.x and later**.

To verify the installed version either:

- Access the front panel; see *Chapter 4, Front Panel Control*.
- Access the Web Browser screens, see *Chapter 5, Web GUI Configuration*.

This manual continues to be relevant to subsequent build versions where the functionality of the equipment has not changed. Where the build standard changes the functionality, a new issue of this manual will be provided.

The appropriate number should be quoted in all correspondence with Ericsson.

1.1.3 New Features in this Release

The 6.7.x release of software for the SPR1100 is delivered with the new features listed below:

- **Reflex:** enables the cost-effective creation of statmux groups by combining the video processing, statmux controller and mux into a single chassis.

- **Audio Leveling Control:** enables operators to comply with national legislation mandating audio leveling control on services.

1.1.4 What Equipment is Covered by this Reference Guide

This Reference Guide covers the SPR1100 Stream Processor and options as listed in the following tables.

1.1.4.1 SPR1100 Stand-alone Options

Table 1.1 Equipment Model Descriptions (Stand-alone Unit)

Marketing Code	Price Object Number	Supply Object Number	Description
SPR11/CHASSIS/1AC	FAZ 101 0161/1	KDU 137 733/1	SPR1100 Chassis with Single AC PSU.
SPR11/CHASSIS/2AC	FAZ 101 0161/2	KDU 137 733/2	SPR1100 Chassis with Dual AC PSU.
SPR11/CHASSIS/1DC	FAZ 101 0161/3	KDU 137 733/3	SPR1100 Chassis with Single DC PSU.
SPR11/CHASSIS/2DC	FAZ 101 0161/4	KDU 137 733/4	SPR1100 Chassis with Dual DC PSU.

Table 1.2 Hardware Options (Stand-alone Unit)

Marketing Code	Price Object Number	Supply Object Number	Description
SPR/HWO/MPM1	FAZ 101 0161/57	ROA 128 4612	SPR Media Processing Module for video & audio. 4 HD or 12 SD video
SPR/UPG/HWO/MPM1	FAZ 101 0161/59	ROA 128 4613	SPR Media Processing Module for video & audio. 4 HD or 12 SD video
SPR/UPG/HWO/BLNK	FAZ 101 0161/11	SXA 215 3768/2	SPR Blanking Plate

Table 1.3 Software Options (Stand-alone Unit)

Marketing Code	Price Object Number	Supply Object Number	Description
SPR/SWO/HDMP4	FAZ 101 0161/13	FAT 102 0831	SPR license 1 HD/SD MPEG-4/2 video service
SPR/SWO/HDMP2	FAZ 101 0161/14	FAT 102 0832	SPR license 1 HD/SD MPEG-2 video service
SPR/SWO/SDMP4	FAZ 101 0161/15	FAT 102 0833	SPR license 1 SD MPEG-4/2 video service

Marketing Code	Price Object Number	Supply Object Number	Description
SPR/SWO/SDMP2	FAZ 101 0161/16	FAT 102 0834	SPR license 1 SD MPEG-2 video service
SPR/SWO/PIP	FAZ 101 0161/17	FAT 102 0835	SPR license 1 PiP service
SPR/SWO/AUD/MP2	FAZ 101 0161/18	FAT 102 0836	SPR license 1 stereo audio transcode to MPEG-1/2 LII
SPR/SWO/AUD/AAC	FAZ 101 0161/19	FAT 102 0837	SPR license 1 stereo audio transcode to HE-AAC-LC
SPR/SWO/AUD/AC3	FAZ 101 0161/20	FAT 102 0838	SPR license 1 stereo audio transcode to Dolby Digital AC3
SPR/SWO/AUD/AC3DEC	FAZ 101 0161/95	FAT 102 0585	SPR license 1 audio Dolby Digital AC3 DECODE
SPR/SWO/FEC/OUT	FAZ 101 0161/96	FAT 102 1602	SPR license 1 ProMPEG FEC output
SPR/SWO/ALC/C	FAZ 101 0161/111	FAT 102 2443	SPR license 1 ALCv2 stereo pair Charged
SPR/SWO/ALC/F	FAZ 101 0161/112	FAT 102 2444	SPR license 1 ALCv2 stereo pair Free
SPR/SWO/IREFLEX	FAZ 101 0161/136	FAT 102 2720	SPR license 1 statmux MPTS
SPR/UPG/SWO/HDMP4	FAZ 101 0161/29	FAT 102 0839	SPR license 1 HD/SD MPEG-4/2 video service
SPR/UPG/SWO/HDMP2	FAZ 101 0161/30	FAT 102 0840	SPR license 1 HD/SD MPEG-2 video service
SPR/UPG/SWO/SDMP4	FAZ 101 0161/31	FAT 102 0841	SPR license 1 SD MPEG-4/2 video service
SPR/UPG/SWO/SDMP2	FAZ 101 0161/32	FAT 102 0842	SPR license 1 SD MPEG-2 video service
SPR/UPG/SWO/PIP	FAZ 101 0161/33	FAT 102 0843	SPR license 1 PiP service
SPR/UPG/SWO/AUD/MP2	FAZ 101 0161/34	FAT 102 0844	SPR license 1 stereo audio transcode to MPEG-1/2 LII
SPR/UPG/SWO/AUD/AAC	FAZ 101 0161/35	FAT 102 0845	SPR license 1 stereo audio transcode to HE-AAC-LC
SPR/UPG/SWO/AUD/AC3	FAZ 101 0161/36	FAT 102 0846	SPR license 1 stereo audio transcode to Dolby Digital AC3
SPR/UPG/SWO/AUD/AC3DEC	FAZ 101 0161/76	FAT 102 1607	SPR upgrade license 1 audio Dolby Digital AC3 decode
SPR/UPG/SWO/FEC/OUT	FAZ 101 0161/77	FAT 102 1608	SPR upgrade license 1 ProMPEG FEC output

Marketing Code	Price Object Number	Supply Object Number	Description
SPR/UPG/SWO/SD2/SD4	FAZ 101 0161/37	FAT 102 0847	SPR upgrade license from SD MPEG-2 to SD MPEG-4
SPR/UPG/SWO/SD2/HD2	FAZ 101 0161/38	FAT 102 0849	SPR upgrade license from SD MPEG-2 to HD MPEG-2
SPR/UPG/SWO/SD2/HD4	FAZ 101 0161/39	FAT 102 0850	SPR upgrade license from SD MPEG-2 to HD MPEG-4
SPR/UPG/SWO/SD4/HD2	FAZ 101 0161/40	FAT 102 0851	SPR upgrade license from SD MPEG-4 to HD MPEG-2
SPR/UPG/SWO/SD4/HD4	FAZ 101 0161/41	FAT 102 0852	SPR upgrade license from SD MPEG-4 to HD MPEG-4
SPR/UPG/SWO/HD2/HD4	FAZ 101 0161/42	FAT 102 0853	SPR upgrade license from HD MPEG-2 to HD MPEG-4
SPR/UPG/SWO/1100/1200	FAZ 101 0161/82	FAT 102 1613	SPR convert SPR1100 to SPR1200
SPR/UPG/SWO/ALC/C	FAZ 101 0161/115	FAT 102 2445	SPR upgrade license 1 ALCv2 stereo pair charged
SPR/UPG/SWO/ALC/F	FAZ 101 0161/116	FAT 102 2446	SPR upgrade license 1 ALCv2 stereo pair free
SPR/UPG/SWO/IREFLEX	FAZ 101 0161/138	FAT 102 2721	SPR upgrade license 1 statmux MPTS

1.1.4.2 SPR1100 1+1 Redundant Bundle Options

Table 1.4 Equipment Model Descriptions (1+1 Redundant Units)

Marketing Code	Price Object Number	Supply Object Number	Description
SPR11/CHASSIS/1AC/RAS	FAZ 101 0161/6	1x KDU 137 733/1 1x KDU 137 733/6	SPR1100 Active Standby Redundant Pair chassis with Single AC PSU. 6 slots available. *2 UNITS*
SPR11/CHASSIS/2AC/RAS	FAZ 101 0161/7	1x KDU 137 733/2 1x KDU 137 733/7	SPR1100 Active Standby Redundant Pair chassis with Dual AC PSU. 4 slots available. *2 UNITS*
SPR11/CHASSIS/1DC/RAS	FAZ 101 0161/8	1x KDU 137 733/3 1x KDU 137 733/8	SPR1100 Active Standby Redundant Pair chassis with Single DC PSU. 6 slots available. *2 UNITS*
SPR11/CHASSIS/2DC/RAS	FAZ 101 0161/9	1x KDU 137 733/4 1x KDU 137 733/9	SPR1100 Active Standby Redundant Pair chassis with Dual DC PSU. 4 slots available. *2 UNITS*

Marketing Code	Price Object Number	Supply Object Number	Description
SPR11/CHASSIS/1AC/RAA	FAZ 101 0161/66	2x KDU 137 733/1	SPR1100 Active Standby Redundant Pair chassis with Single AC PSU. 6 slots available. *2 UNITS*
SPR11/CHASSIS/2AC/RAA	FAZ 101 0161/67	2x KDU 137 733/2	SPR1100 Active Standby Redundant Pair chassis with Dual AC PSU. 4 slots available. *2 UNITS*
SPR11/CHASSIS/1DC/RAA	FAZ 101 0161/68	2x KDU 137 733/3	SPR1100 Active Standby Redundant Pair chassis with Single DC PSU. 6 slots available. *2 UNITS*
SPR11/CHASSIS/2DC/RAA	FAZ 101 0161/69	2x KDU 137 733/4	SPR1100 Active Standby Redundant Pair chassis with Dual DC PSU. 4 slots available. *2 UNITS*

Table 1.5 Hardware Options (1+1 Redundant Units)

Marketing Code	Price Object Number	Supply Object Number	Description
SPR/HWO/MPM1/R	FAZ 101 0161/58	2x ROA 128 4612	SPR Redundant Pair: Media Processing Module video + audio. 4HD/12SD *2 MODULES*
SPR/UPG/HWO/MPM1/R	FAZ 101 0161/60	2x ROA 128 4613	SPR Redundant Pair: Media Processing Module video + audio. 4HD/12SD *2 MODULES*
SPR/UPG/HWO/BLNK/R	FAZ 101 0161/12	2x SXA 215 3768/2	SPR Redundant Pair: Blanking Plate *2 BLANKS, 1 for each chassis*

Table 1.6 Software Options (1+1 Redundant Units)

Marketing Code	Price Object Number	Supply Object Number	Description
SPR/SWO/HDMP4/R	FAZ 101 0161/21	2x FAT 102 0831	SPR Redundant Pair: license 1 HD/SD MPEG-4/2 video service
SPR/SWO/HDMP2/R	FAZ 101 0161/22	2x FAT 102 0832	SPR Redundant Pair: license 1 HD/SD MPEG-2 video service
SPR/SWO/SDMP4/R	FAZ 101 0161/23	2x FAT 102 0833	SPR Redundant Pair: license 1 SD MPEG-4/2 video service
SPR/SWO/SDMP2/R	FAZ 101 0161/24	2x FAT 102 0834	SPR Redundant Pair: license 1 SD MPEG-2 video service

Marketing Code	Price Object Number	Supply Object Number	Description
SPR/SWO/PIP/R	FAZ 101 0161/25	2x FAT 102 0835	SPR Redundant Pair: license 1 PiP service
SPR/SWO/AUD/MP2/R	FAZ 101 0161/26	2x FAT 102 0836	SPR Redundant Pair: license 1 stereo audio transcode to MPEG-1/2 LII
SPR/SWO/AUD/AAC/R	FAZ 101 0161/27	2x FAT 102 0837	SPR Redundant Pair: license 1 stereo audio transcode to HE-AAC-LC
SPR/SWO/AUD/AC3/R	FAZ 101 0161/28	2x FAT 102 0838	SPR Redundant Pair: license 1 stereo audio transcode to Dolby Digital AC3
SPR/SWO/AUD/AC3DEC/R	FAZ 101 0161/101	2x FAT 102 0585	SPR Redundant Pair: license 1 audio Dolby Digital AC3 DECODE
SPR/SWO/FEC/OUT/R	FAZ 101 0161/102	2x FAT 102 1602	SPR Redundant Pair: license 1 ProMPEG FEC output
SPR/SWO/ALC/C/R	FAZ 101 0161/113	2x FAT 102 2443	SPR Redundant Pair: license 1 ALCv2 stereo pair Charged
SPR/SWO/ALC/F/R	FAZ 101 0161/114	2x FAT 102 2444	SPR Redundant Pair: license 1 ALCv2 stereo pair Free
SPR/SWO/IREFLEX/R	FAZ 101 0161/137	2x FAT 102 2720	SPR Redundant Pair: license 1 statmux MPTS
SPR/UPG/SWO/HDMP4/R	FAZ 101 0161/43	2x FAT 102 0839	SPR Redundant Pair: license 1 HD/SD MPEG-4/2 video service
SPR/UPG/SWO/HDMP2/R	FAZ 101 0161/44	2x FAT 102 0840	SPR Redundant Pair: license 1 HD/SD MPEG-2 video service
SPR/UPG/SWO/SDMP4/R	FAZ 101 0161/45	2x FAT 102 0841	SPR Redundant Pair: license 1 SD MPEG-4/2 video service
SPR/UPG/SWO/SDMP2/R	FAZ 101 0161/46	2x FAT 102 0842	SPR Redundant Pair: license 1 SD MPEG-2 video service
SPR/UPG/SWO/PIP/R	FAZ 101 0161/47	2x FAT 102 0843	SPR Redundant Pair: license 1 PiP service
SPR/UPG/SWO/AUD/MP2/R	FAZ 101 0161/48	2x FAT 102 0844	SPR Redundant Pair: license 1 stereo audio transcode to MPEG-1/2 LII
SPR/UPG/SWO/AUD/AAC/R	FAZ 101 0161/49	2x FAT 102 0845	SPR Redundant Pair: license 1 stereo audio transcode to HE-AAC-LC
SPR/UPG/SWO/AUD/AC3/R	FAZ 101 0161/50	2x FAT 102 0846	SPR Redundant Pair: license 1 stereo audio transcode to Dolby Digital AC3

Marketing Code	Price Object Number	Supply Object Number	Description
SPR/UPG/SWO/AUD/AC3D EC/R	FAZ 101 0161/84	2x FAT 102 1607	SPR Redundant Pair: upgrade license 1 audio Dolby Digital AC3 decode
SPR/UPG/SWO/FEC/OUT/R	FAZ 101 0161/85	2x FAT 102 1608	SPR Redundant Pair: upgrade license 1 ProMPEG FEC output
SPR/UPG/SWO/SD2/SD4/R	FAZ 101 0161/51	2x FAT 102 0847	SPR Redundant Pair: upgrade license from SD MPEG-2 to SD MPEG-4
SPR/UPG/SWO/SD2/HD2/R	FAZ 101 0161/52	2x FAT 102 0849	SPR Redundant Pair: upgrade license from SD MPEG-2 to HD MPEG-2
SPR/UPG/SWO/SD2/HD4/R	FAZ 101 0161/53	2x FAT 102 0850	SPR Redundant Pair: upgrade license from SD MPEG-2 to HD MPEG-4
SPR/UPG/SWO/SD4/HD2/R	FAZ 101 0161/54	2x FAT 102 0851	SPR Redundant Pair: upgrade license from SD MPEG-4 to HD MPEG-2
SPR/UPG/SWO/SD4/HD4/R	FAZ 101 0161/55	2x FAT 102 0852	SPR Redundant Pair: upgrade license from SD MPEG-4 to HD MPEG-4
SPR/UPG/SWO/HD2/HD4/R	FAZ 101 0161/56	2x FAT 102 0853	SPR Redundant Pair: upgrade license from HD MPEG-2 to HD MPEG-4
SPR/UPG/SWO/1100/1200/R	FAZ 101 0161/92	1x FAT 102 1613 1x FAT 102 1615	SPR Redundant Pair: convert SPR1100 to SPR1200
SPR/UPG/SWO/RAS/RAA	FAZ 101 0161/86	1x FAT 102 1617	SPR Redundant Pair: convert active-standby pair to active-active pair
SPR/UPG/SWO/RAA/RAS	FAZ 101 0161/87	1x FAT 102 1618	SPR Redundant Pair: convert active-active pair to active-standby pair
SPR/UPG/SWO/ALC/C/R	FAZ 101 0161/117	2x FAT 102 2445	SPR Redundant Pair: license 1 ALCv2 stereo pair charged
SPR/UPG/SWO/ALC/F/R	FAZ 101 0161/118	2x FAT 102 2446	SPR Redundant Pair: license 1 ALCv2 stereo pair free
SPR/UPG/SWO/IREFLEX/R		2x FAT 102 2720	SPR Redundant Pair: license 1 statmux MPTS

1.2 SPR1100 Systems Overview

The Ericsson SPR1100 is a high-density-broadcast video processor for operators to launch additional television services to the home, manage and migrate to MPEG-4 AVC, simplify time-shift TV ingest processing, and enable cost-efficient disaster recovery sites for business continuity.

Designed for video-turnaround applications requiring video and audio transcoding or bit-rate changing, the Ericsson SPR1100 supports any-to-any MPEG-2 / MPEG-4 AVC / HD / SD transcoding for up to 24 HD or 72 SD video services, up to 144 stereo audio services and can simultaneously generate Picture-in-Picture (PIP) service for all channels processed.

The SPR1100 Stream Processor is suited for Telco and Cable IPTV platforms. In addition, it can serve as a high-quality bit-rate changer allowing for lower overall bit rates or VBR to CBR conversion for applications such as time-shift TV ingest.

1.2.1 Application Overview: Broadcast Transcoding

The SPR1100 targets four application areas.

1.2.1.1 Application #1: Channel Tiering

Operators have extensive channel line-ups, but not all channels are treated equally. Some channels are premium and drive the majority of viewing figures, whereas other channels represent the long-tail of viewing. Such channels include, for example, must-carry channels, specialist channels, etc.

Presenting operators with a single product to cover this range is not viable. Premium products are too expensive for the long-tail channels, whereas non-premium products do not offer sufficient picture quality for the main channels.

The solution is a product range that enables channel tiering. In Ericsson's case, the VPC chassis coupled with EN-series cards represents our premium offering, with a focus on picture quality and the expense of density. The SPR1100 targets the long-tail channels, and focuses on density whilst making as small a compromise as possible in picture quality.

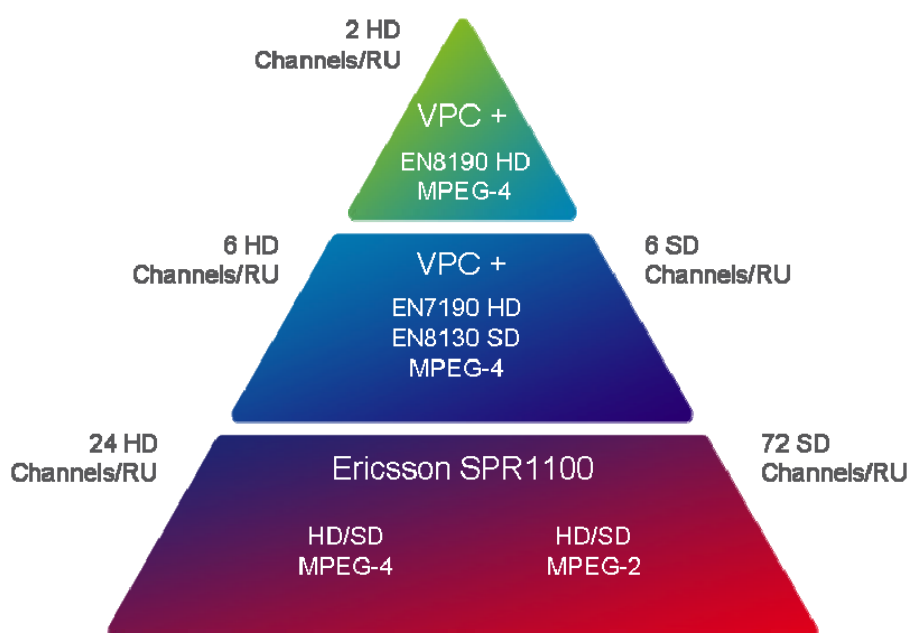


Figure 1.1 SPR1100 Channel Tiering

1.2.1.2 Application #2: Disaster Recovery

Many operators run disaster recovery sites in case some localized issue (flooding, fire damage, power loss, adverse weather, etc.) prevents the main head-end from working. Disaster recovery sites therefore exist to temporarily take over from the main site.

Such sites are run to a budget, because it does not make sense to replicate an expensive, premium head-end if the back-up head-end is only for occasional, temporary use. Hence space is at a premium (real-estate being a key method to reduce costs), and the need for premium picture quality is also reduced if this is a route for cost reduction.

In such applications, the SPR1100 is a perfect offering. It can cover the entire channel line-up in only a few chassis, and offers very low cost per channel pricing.

1.2.1.3 Application #3: New Services

Operators are always looking to deploy new value-added services in order to reduce user churn and remain competitive. However, such new services need to fit into existing head-end real-estate and, as ever more services are added, space becomes a constraining factor.

The next service launch operators are targeting is catch-up TV, in which channels are encoded differently to the linear channel ready for recording. For example, in a cable system, linear channels might all be encoded using MPEG-2 for backward compatibility with old boxes. The catch-up service, however, can be targeted only at newer H264-capable boxes, and hence can take advantage of the better bit rate efficiency of H264.

The SPR1100 is therefore ideal for such services, because it is a very space-efficient solution to providing parallel encoding of TV services.

1.2.1.4 Application #4: Cable Architecture Evolution

Cable operators evolve through different architectures as they add new services (raising bandwidth requirements) and attempt to manage cost (by reducing bandwidth consumed). *Figure 1.2* below illustrates this progression, with network types shown in grey text and solution types in green text. Dense transcoding, as fulfilled by the SPR1100, is highlighted in red text.

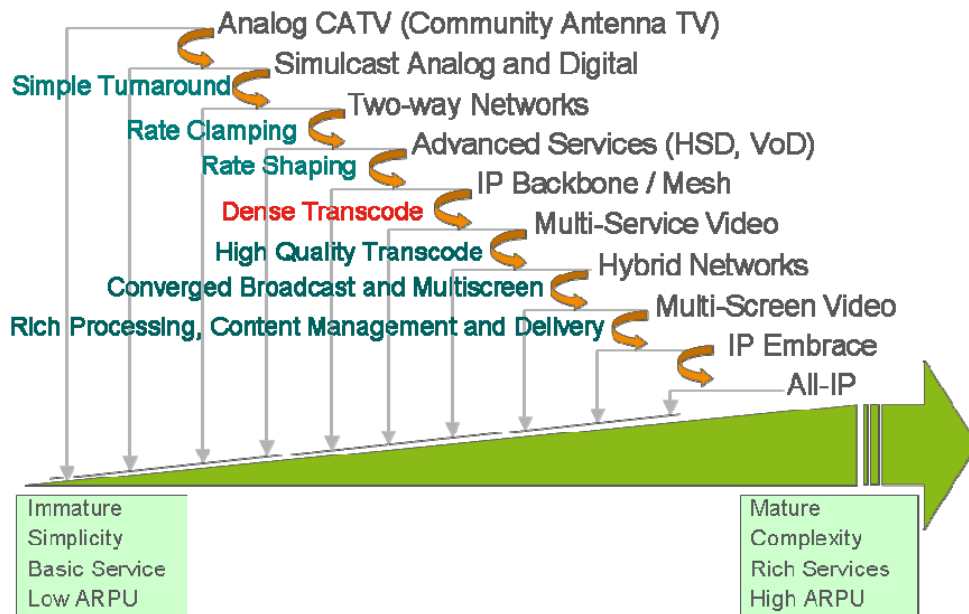


Figure 1.2 SPR1100 Cable Architecture Evolution

1.2.2 Standalone and 1 + 1 Packages

The Ericsson SPR1100 is available as two main packages:

- A Standalone unit
- A bundle of two units for 1+1 automatic redundancy

The unit has a number of reliability features including choice of single or dual power supply and hot-swap processing modules for in-field servicing and expansion. An advanced web-based user interface allows easy configuration, without the need for an external control system, which allows the Ericsson SPR1100 to be added to any existing installation needing dense video transcoding.

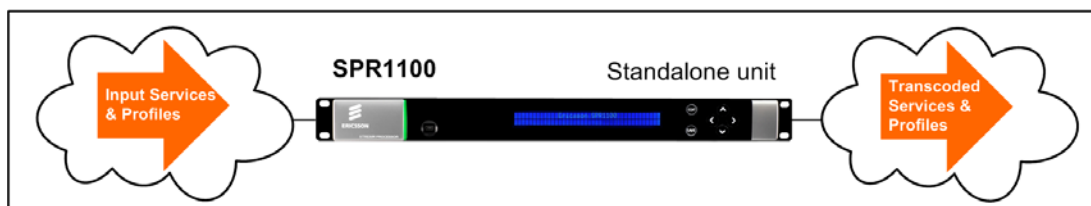


Figure 1.3 SPR1100 Standalone System

A large number of services can be processed in a single unit. With the addition of a backup unit you can ensure that services remain on-air.

For redundant operation, 1+1 redundant pair configuration units is recommended as an n+1 configuration for redundancy would create unacceptable service outages during redundancy switch time. The high availability configuration with a hot-standby spare running as automatic 1+1 mirrored units ensures maximum reliability and service up-time.

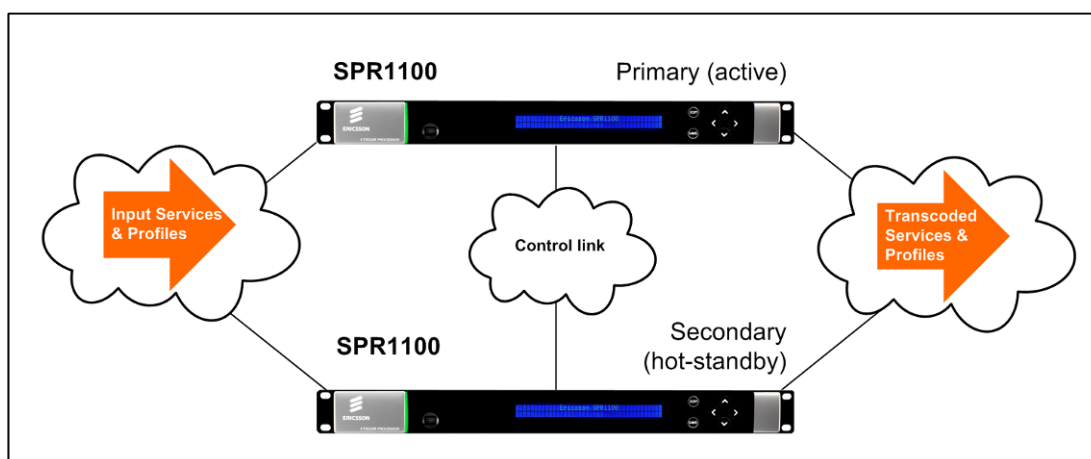


Figure 1.4 SPR1100 1+1 Redundant System

The 1+1 redundant pair units are designed as a matched pair, and will only work when they are connected together as a redundant pair.

1+1 redundant operation is controlled by the SPR1100 unit itself: it does not need or use nCompass Control by Ericsson for redundancy control.

1.3 Summary of Features

1.3.1 Video Processing

1.3.1.1 License Enabled Resolutions

Software licenses and upgrade options are available from Ericsson to enable operation and transcoding at the required resolutions.

Table 1.7 License Enabled Resolutions

License	16:9 Resolutions	4:3 Resolutions
HD MPEG-4	1080i x 1920 \ 1440 \ 1280 (@ 25 and 29.97 fps)	N/A
HD MPEG-2	1080pSF 1080 x 1920 (@ 23.976 fps) 720p x 1280 / 960 (@50 and 59.94 fps)	
SD MPEG-4	576i x 720 / 704 / 640 / 544 / 528 / 480 / 352 (@ 25 fps and 29.97 fps)	
SD MPEG-2		
PiP	MPEG-4 MP @ L1.3 128x96, 96x96, 192x192, 144x144 (@ 25 and 29.97 fps)	

1.3.1.2 Video Transcoding

The SPR1100 permits a large number of transcoding permutations:

Table 1.8 General Transcoding Permutations

IN	OUT	Includes
MPEG-2 or MPEG-4	MPEG-2 or MPEG-4	Transrating & transcoding
SD or HD	SD or HD	Up and down conversion
MPTS or SPTS	MPTS or SPTS	
Video VBR or CBR	CBR only	
Unicast or multicast	Unicast or multicast	
Progressive to Interlace at 720p60	SD Interlaced resolutions	

Table 1.9 SPR1100 NSTC Transcoding Permutations

INPUT NSTC i30			Outputs																
			Any Res	1080i			720p		SD						1080PsF	PIP			
			i25	1920 i30	1440 i30	1280 i30	1280 P60	960 P60	720 i30	704 i30	640 i30	544 i30	528 i30	480 i30	352 i30	1920 P23.976	192x192 i30	144x144 i30	128x96 i30
HD 1080i	1920	x 1080i 30 (NSTC)	N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
	1440		N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
	1280		N				N	N	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y
720p	1280	x 720p 60 (NSTC)	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
	960		N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
SD	720	480 i30 (NSTC)	N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
	704		N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
	640		N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
	544		N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
	528		N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
	480		N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
	352		N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
1080PsF 23.976 Hz	1920	x 1080PsF 23.976	N	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	

Table 1.10 SPR1100 PAL Transcoding Permutations

INPUT PAL i25			Outputs																	
			Any Res	1080i			720p		SD						1080PsF	PIP				
			i30	1920 i25	1440 i25	1280 i25	1280 P50	960 P50	720 i25	704 i25	640 i25	544 i25	528 i25	480 i25	352 i25	1920 P23.976	192x192 i25	144x144 i25	128x96 i25	96x96 i25
HD 1080i	1920	x 1080i 25 (PAL)	N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
	1440		N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	
	1280		N				N	N	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	
720p	1280	x 720p 50 (PAL)	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	
	960		N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	
SD	720	480 i25 (PAL)	N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
	704		N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	
	640		N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	
	544		N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	
	528		N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	
	480		N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	
	352		N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	
1080PsF 23.976 Hz	1920	x 1080PsF 23.976	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	

Note: The SPR1100 is a full decode and re-encode solution, unlike some competitor products that can only achieve density by running in a rate-shaping mode. However, this does mean performance of the SPR1100 is determined partly by the nature of the upstream device – if this produces a non-standard transport stream, the SPR1100 may not be able to decode it.

The SPR1100 cannot transcode:

- Across frame rates; 25, 29.98 and 23.976 fps.
- Interlaced to progressive.

1.3.1.3

Video Pass Through

Video Pass through is not possible on the SPR1100.

1.3.1.4

Quantity of Video Transcodes per Module

The maximum number of video transcodes per module is as follows:

- Up to 12 SD to SD transcodes.
- Up to four transcodes that have an HD input and/or output.

Note: The quantities listed above are only dependent on the resolution. They are independent of the codec i.e. MPEG-2 or MPEG-4.

- Video transcodes can be mixed and matched in a suitable module as shown in *Table 1.11*.

Table 1.11 Mix and Match of Video Transcodes in a Module

Number of HD Transcodes	Number of SD Transcodes
0	Up to 12
1	Up to 9
2	Up to 6
3	Up to 3
4	0

For example; the following transcoding scenarios are possible:

- 3 x SD MPEG-2 can be transcoded to SD MPEG-4.
- 3 x SD MPEG-4 can be transcoded to SD MPEG-4
- 1 x HD MPEG-4 can be transcoded to SD MPEG-4.
- 1 x HD MPEG-4 can be transcoded to HD MPEG-4.

The number of SD to SD transcodes that can be carried out by a module has an additional limitation. There are four transcoding chips on each module and each chip can carry out three SD to SD transcodes but all transcodes on the chips must be the same i.e. all SD MPEG-2 to SD MPEG-4 or all SD MPEG-4 to SD MPEG-4.

For example; a module can carry out the following video transcodes:

- 3 x SD MPEG-2 to SD MPEG-4
- 9 x SD MPEG-4 to SD MPEG-2

But can out carry the following transcodes:

- 2 x SD MPEG-2 to SD MPEG-4
- 10 x SD MPEG-4 to SD MPEG-2

1.3.1.5 Number of Transport Streams

The current release of the SPR1100 can ingest up to 64 transport streams. This can impact SD transcoding density if all inputs are SPTS.

1.3.1.6 PiP Generation

One PiP can be generated for each video transcode as shown in the following examples:

- For up to 72 SD services, 72 PiPs can be generated.
- For up to 24 HD services, 24 PiPs can be generated.
- For up to 10 SD and 12 HD services, 22 PiPs can be generated.

Notes: If a PiP is not generated for one video transcode, then this unused PiP can be used to generate 2 PiPs on another video transcode.

The PiP time is aligned to the main video both have the same PTS (Presentation Time Stamp) value.

1.3.1.6.1 Creating a PiP in a SPTS

A PiP is normally created in an MPTS with the main video but it is also possible to create a PiP in a new SPTS while the main video remains in a separate SPTS.

Note the current software release for the SPR1100 only supports a maximum of 72 individual transport streams. Therefore when running with PiP in a separate SPTS, the number of output transport streams is limited to 36.

To create a PiP in a separate SPTS:

1. Create a new PiP service.
2. Create a new TS Output Stream.
3. Drag and drop the PiP component into the new output stream.

1.3.1.7 One-to-Many Transcoding

It is possible to transcode an input video multiple times to different formats and different bit rates. See *Table 1.12* for examples.

Table 1.12 Transcoded Video Options

Input	Possible Outputs
MPEG-4 HD	MPEG-4 HD MPEG-4 SD MPEG-4 SD different bit rate

An input video stream can be duplicated by up to twice the number of modules in the chassis. A PiP can be produced with each transcoded output.

Note: Each transcode of the same input source counts as a different transcode, when calculating the number of transcodes possible per module.

1.3.1.8 Output Video Duplication

A transcoded video output can be duplicated to produce up to four copies. These copies are required to be sent to different MPTSs and/or different IP addresses.

1.3.2 Audio Processing

1.3.2.1 Audio Transcoding

The SPR1100 can transcode between any of the formats below:

- MPEG-1 layer 2
- MPEG-2 layer 2
- Dolby Digital (AC-3) stereo
- Dolby Digital (AC-3) 5.1
- HE-AAC stereo
- HE-AAC 5.1
- AAC-LC stereo
- AAC-LC 5.1

It is possible to down-mix 5.1 to stereo, and up-mix stereo to 5.1. However, up-mixing stereo to 5.1 only actually puts the stereo on the 5.1, leaving the 3.1 silent.

1.3.2.2 Quantity of Audio Transcodes per Module

The maximum number of audio transcodes per module is dependent on what it transcodes from and to. The maximum number per_module is shown in *Table 1.13*.

Table 1.13 Maximum Quantity of Audio Transcodes per Module

		Encode to:				
		MP1 L2 2.0	DD (AC3) 2.0	DD (AC3) 5.1	HE-AAC-LC 2.0	HE-AAC-LC 5.1
Decode from:	MP1 L2 2.0	24	12	n/a	24	n/a
	DD (AC3) 2.0	18	12	n/a	12	n/a
	DD (AC3) 5.1	18	12	6	12	6
	HE-AAC-LC 2.0	12	12	n/a	12	n/a
	HE-AAC-LC 5.1	12	12	6	12	6

The numbers above assume that all the audio transcodes on a particular module are the same. When mixing different audio transcodes, the maximum numbers should be scaled accordingly.

Audio transcodes are carried out on the module audio daughter card and can only be done on the same module on which the associated video is transcoded. Consequently, audio transcodes for a video service cannot be split across two or more modules.

1.3.2.3

Quantity of Audio Transcodes per Video Service

Up to eight audio transcodes can be carried out per video service.

The audio transcodes can be from eight different audio streams (e.g. different languages), or can all come from one audio stream.

Table 1.14 Quantity of Audio Transcodes per Video Service

Input	Output
AAC (English)	AAC 180 kbps AAC 90 kbps MPEG-1 L2 200 kbps
AAC (Spanish)	AAC 180 kbps MPEG-1 L2 200 kbps
AAC (French)	MPEG-1 L2 200 kbps
AAC (German)	MPEG-1 L2 200 kbps
AAC (Chinese)	MPEG-1 L2 200 kbps

One video service may have up to eight audio transcodes but the maximum number of audio transcodes per module also applies.

For example, there is a maximum of 24 MPEG L2 to AAC transcodes per module and these may be utilized as follows:

- Three video services, each with eight MPEG-2 – AAC transcodes and the remaining services with pass through audio only.

Or

- Two video services, each with eight transcodes. Another two video services, each with four transcodes (making a total of 24) and the remaining services with pass through audio only.

1.3.2.4

Quantity of Audio Pass Through

The possible quantity of audio pass through is defined by the sum of audio and data pass through. The following pass through scenarios are possible:

- Up to eight audio and data components can be passed through per service. These can be all audio, all data or a mix of the two.
- Up to 47 audio and data components can be passed through per module.

- Up to 47 (x the number of modules) audio and data components can be passed through per chassis.

Note: The maximum number of pass throughs per module also applies to the above scenarios.

Each video service can therefore have up to eight transcoded audios and up to eight passed through components (audio and data).

1.3.2.5 **Output Audio Duplication**

Both transcoded and passed through audio outputs can be duplicated to produce up to four copies of each. These copies are required for sending to different MPTS's and/or different IP addresses.

1.3.3 **Data PIDs**

1.3.3.1 **Data Pass Through**

The SPR1100 will pass through the following:

- DVB Subtitles.
- Teletext.
- Closed Captions (passed through and recaptioned).
- WSS.
- AFD (which will be corrected to reflect and aspect ratio change).
- EBIF.
- SCTE 127 VBI
- Private data such as interactive TV, PIDs and tables.

Data PIDs are passed through and re-time aligned with the transcoded video they are associated with.

1.3.3.2 **Quantity of Data Pass Through**

The possible quantity of audio pass through is defined by the sum of audio and data pass through. See *Section 1.3.2.4* for further details.

1.3.3.3 **Output Data Duplication**

Output data can be duplicated to produce up to four copies of each. These copies are required for sending to different MPTS's and/or different IP addresses.

1.3.3.4 Subtitles

When subtitles are passed through with a video stream that is either up or down converted, the subtitle text size is not rescaled, so it appears too big or small for the new video resolution. For example:

- When the video is down converted (HD to SD) the subtitle text becomes smaller.
- When the video is up converted (SD to HD) the subtitle text becomes larger.

The text position may also be incorrect.

1.3.3.5 Closed Captions

Closed captions in the incoming Transport Stream will be encoded in the output stream using:

- ATSC A/53 in MPEG-2 video.
- ATSC A/72 in MPEG-4 video.

1.3.4 Service Components

Each service must have one video stream and must have:

- 1 PiP.
- Up to eight transcoded audio streams,

And

- Up to eight passed through components (which may be all audio, all data or a mix of audio and data).

1.3.5 PID Processing

1.3.5.1 PID Remapping

In the default setting, the PIDs on the input service elements are carried through onto the output service. However, the PID numbers can be changed on any or all of the PIDs in a service and they are remapped accordingly in the PMT.

PID remapping is always required when duplication of a service or service element is performed as copies cannot have the same PID.

1.3.5.2 Change of Input PIDs

If a PID on an input service is changed, the SPR1100 cannot automatically follow the change. Within the unit, the link between the input and output service is made on the service name and not the PID number. However, the input PID is linked to the input service name, so, if the PID changes, the link to the service name is lost.

1.3.6 Table Processing

The SPR1100 generates the following tables:

- PAT (Program Association Table).
- PMT (Program Map Table).
- SDT (Service Descriptor Table).
- CAT (Conditional Access Table).

The SPR1100 will not pass through or process any other tables and these, including the following, will be dropped:

- EIT (Event Information Table).
- NIT (Network Information Table).
- SDT (Service Description Table).

1.3.6.1 Multiple PMTs in a PID

The SPR1100 can support incoming MPTSs where the PMTs for the services are in one PID.

1.3.7 Transport Streams

1.3.7.1 Unicast Input

An incoming unicast is detected by its IP address. If the IP address is outside the reserved multicast address range, it is treated as a unicast.

1.3.8 Redundancy

The SPR1100 supports the following redundancy modes:

- Input source redundancy.
- Input port redundancy:
 - Active active 1+1 redundant pair or
 - 2 inputs adding together i.e. each receiving different streams.
- Output Port redundancy:
 - Active standby only.
 - No active active yet.
- Chassis redundancy:
 - 1+1 active standby.

- 1+1 active active.
- PSU (when dual PSU fitted).

The SPR1100 does not support the following redundancy modes:

- Module level.
- Service Level.

1.3.8.1 Redundancy Switch Times

Redundancy switch times are shown in *Table 1.15*.

Table 1.15 Redundancy Switch Times

Redundancy Mode	Failure Mode	Switch Over Behavior	Switch Time
Input source			
Input port			0s as active active input
Output port			
1+1 chassis (active-standby)	Manual switch		1.5 - 4 s
	Loss of IP input (all multicasts)		2 - 3 s
	Loss of one service		2 - 3 s
	Critical alarm from primary to secondary chassis across control line	Primary stops streaming, & secondary starts to stream	2 - 3 s
	Power loss on primary chassis	* Secondary sends MGP to primary to enforce that it isn't streaming, * then secondary starts to stream	7 - 10 s
	Control line between primary & secondary chassis is lost	* Secondary sends MGP to primary to enforce that it isn't streaming, * then secondary starts to stream	7 - 10 s

1.3.9 SPR1100 and nCC

SPR1100 is configured via its own internal web browser.

The SPR1100 GUI web page is usually opened using a web browser on a PC. However, it is also possible to open the GUI web page from within nCC and to configure the SPR1100 as normal on that web page.

Note: The SPR1100 is not being configured from nCC, it can only be viewed.

nCC also monitors alarms from the SPR1100 and displays them on its GUI.

nCC shows which unit is active in a 1+1 SPR1100 pair. It can also force a manual redundancy switch.

1.4 Front Panel

The user interface for the Front Panel consists of an alphanumeric Liquid Crystal Display, pushbuttons, and a status LED that are used to set-up, control and monitor the unit.

Various menu screens can be navigated on the LCD using the pushbuttons, which allow you to select and modify key parameters and features of the unit.

Full details of the front panel menus and information on the use of these controls is given in *Chapter 3, Front Panel Control*.

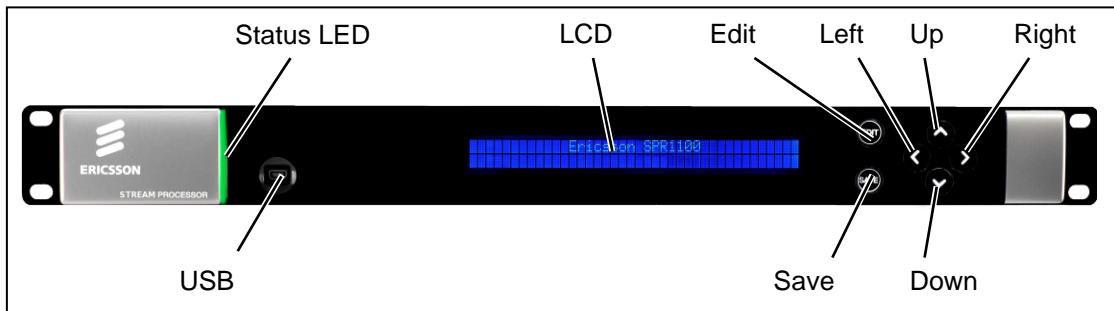


Figure 1.5 SPR1100 Front Panel

Table 1.16 Front Panel Controls

Item	Color	Description
USB Connector	-	This connector is for factory / service use only.
Status LED	Red	Fault. Indicates a fault condition, e.g. a missing or faulty input signal. It should be off for correct operation, although it may be lit briefly during power up.
	Amber	Locked / Non-Functional. Indicates that the unit is locked to a Transport Stream, but also indicates incorrect conditions or incorrect system functioning.
	Green	Locked / Functional. Indicates that the unit is locked to a Transport Stream and also indicates correct conditions and correct system functioning.
LCD	-	2-line x 40-character back-lit dot-matrix Liquid Crystal Display (LCD).

Item	Color	Description
Edit	-	This pushbutton enables you to edit the parameters on the selected LCD menu. Press again to exit without saving any changes. Integral LED lit when functional.
Save	-	This pushbutton enables you to save any modified parameters on the selected LCD menu. Integral LED lit when functional.
▲ Up ▼ Down ◀ Left (Back) ▶ Right (Forward)	-	Navigation pushbuttons for selecting relevant LCD menu or for incrementing / decrementing selected parameter values. Integral LED lit when functional.

1.5 Base Units

The SPR1100 Stream Processor is constructed using a screened self-ventilated modular system. The unit may be operated freestanding or mounted in a 19-inch rack.

The unit is a flexible platform consisting of a base unit (or chassis) into which up to six Media Processing Modules (MPMs) can be plugged.

The base unit provides Ethernet control interfaces, and Ethernet data interfaces, which are accessible at the rear panel. It also provides transport stream processing functionality. Other functionality, including transcoding, is provided by the Media Processing Modules.

The base unit provides:

- 19 inch 1 'RU' rack-mount chassis.
- Front panel LCD and keypad for limited control and status reporting.
- Front Panel tri-color LED to indicate unit health.
- Dual redundant Ethernet control ports.
- Two pairs of dual redundant Ethernet ports for data input and output.
- Single or dual AC power supply, depending on the model ordered.
- Single or dual DC power supply, depending on the model ordered.

Four or six Media Processing Module slots, depending on the model ordered. Modules are 'hot swappable'; inserted or removed while the unit is powered.

1.6 Rear Panels

The paragraphs below summarize the features of the main models and show the rear panels.

Details of the rear panel connectors are given in *Chapter 2, Installing the Equipment*.

1.6.1 SPR11/CHASSIS/1AC – 1U Unit with Single AC Power Supply

This Ericsson SPR1100 model consists of a base chassis, provides a single AC power input and enables up to six Media Processing Modules to be fitted.

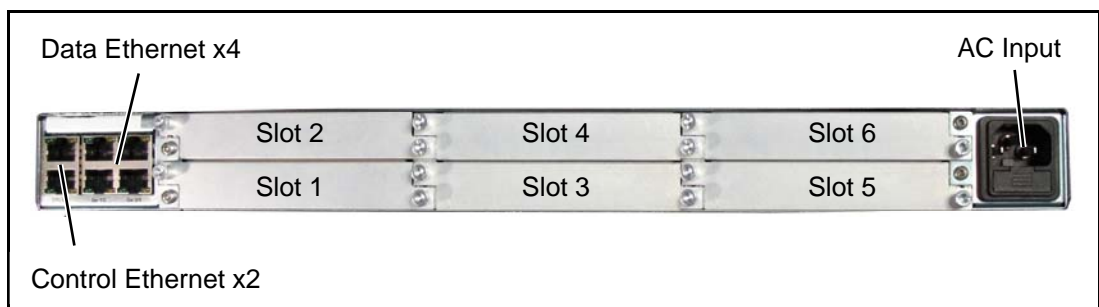


Figure 1.6 SPR11/CHASSIS/1AC Rear Panel – Single AC Input

1.6.2 SPR11/CHASSIS/2AC – 1U Unit with Dual AC Power Supply

This Ericsson SPR1100 model consists of a base chassis, provides dual AC power inputs and enables up to four Media Processing Modules to be fitted.

Many broadcasting sites have two power supply chains, either from the master switchboard or, for major sites, from different points on the supply grid. As the most common cause of system failure is loss of power, feeding the chassis from two separate chains ensures reliability of supply and, therefore, continuity of service.

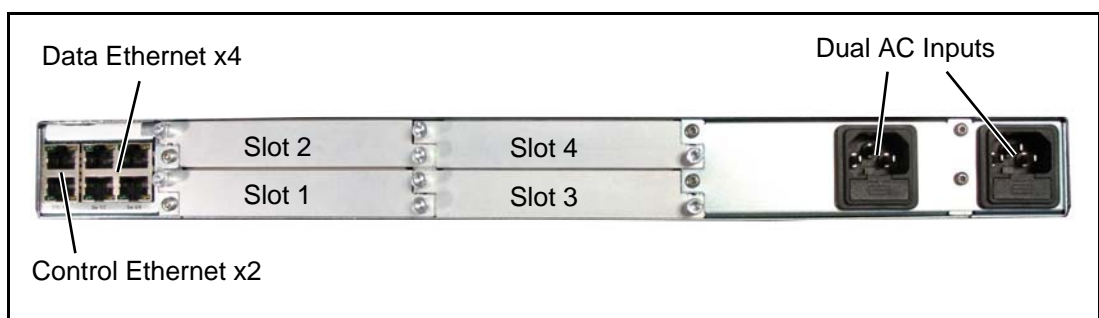


Figure 1.7 SPR11/CHASSIS/2AC Rear Panel – Dual AC Inputs



1.6.3 SPR11/CHASSIS/1DC – 1U Unit with Single DC Supply

This Ericsson SPR1100 model consists of a base chassis, provides a single DC power input and enables up to six Media Processing Modules to be fitted.

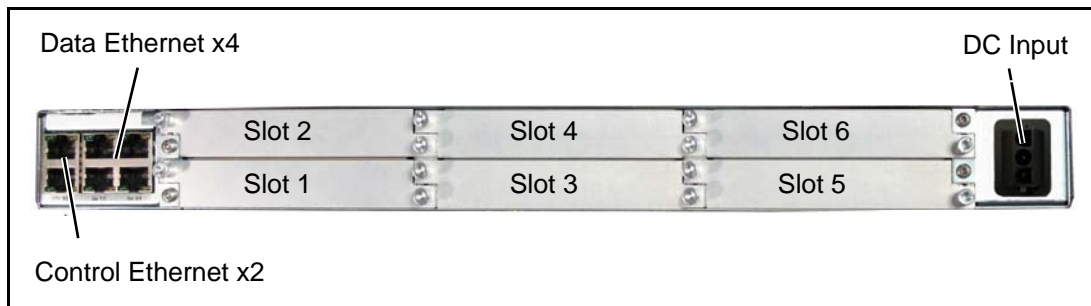


Figure 1.8 SPR11/CHASSIS/1DC Rear Panel – Single DC Input

1.6.4 SPR11/CHASSIS/2DC – 1U Unit with Dual DC Power Supply

This Ericsson SPR1100 model consists of a base chassis, provides a single DC input and enables up to six Media Processing Modules to be fitted.

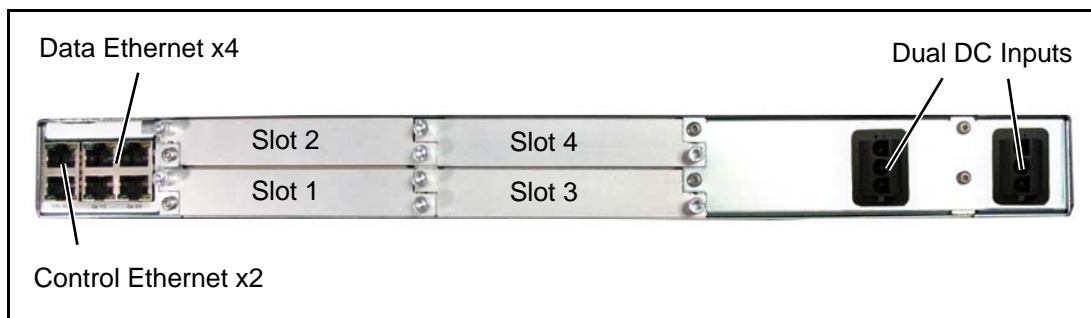


Figure 1.9 SPR11/CHASSIS/2DC Rear Panel – Dual DC Inputs

Table 1.17 Rear Panel Connectors

Item	Type	Description
AC Input	CEE 22/IEC 3-pin male connector	AC Power Input Connector.
DC Input	AMP Universal MATE-N-LOK	DC Power Input Connector
Data Ethernet	RJ-45 (100/1000BaseT)	Gigabit IP data / feed output on dual redundant connectors.
Control Ethernet	RJ-45 (100/1000BaseT)	Gigabit IP data / feed output on dual redundant connectors.

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Installing the Equipment

Chapter 2

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2.1 Read This First!

2.1.1 Handling

The equipment must be handled and installed carefully and thoughtfully to prevent safety hazards and damage.

2.1.2 Installing the Equipment

Ensure the personnel designated to fit the unit have the appropriate skills and knowledge. If in any doubt, contact Ericsson Customer Services (see *Preliminary Pages* for contact details).

Installation of the product should follow these instructions, and should only use installation accessories recommended by the manufacturers. When rack mounted, this equipment must have shelf supports as well as being fixed at the front panel.

Do not use this product as a support for any other equipment.

2.1.3 Lifting

In some circumstances the unit might be awkward to lift. In which case, do not attempt to lift or move it without proper assistance or equipment. If in doubt, seek assistance.

2.1.4 Site Requirements

2.1.4.1 Power Supplies

See *Annex B Technical Specification* for a full specification.

2.1.4.2 Environment

See *Annex B, Technical Specification* for a full specification.

Do not install this product in areas of high humidity or where there is danger of water ingress.

2.1.4.3 Lightning Protection



Warning!

If the unit has been subject to a lightning strike or power surge which has stopped it working, disconnect the power immediately. Do not re-apply power until it has been checked for safety. If in doubt, contact Ericsson Customer Services.

Where appropriate, ensure this product has an adequate level of lightning protection. Alternatively, during a lightning storm or when it is left unattended and unused for long periods of time, unplug it from the supply outlet and disconnect the output equipment. This prevents damage to the product due to lightning and power line surges.

2.2 Preliminary Checks

2.2.1 Mechanical Inspection

When taking delivery of a unit check the equipment items delivered against the enclosed delivery note. Inspect the equipment for damage in transit. If in doubt, contact Ericsson Customer Services (see *Preliminary Pages*).

Note: Do not remove the covers of this equipment as doing so may invalidate any warranties, cause a safety hazard and/or affect the EMC performance. It may also invalidate any safety tests. Check with Ericsson Customer Services beforehand.

2.2.2 Moving the Equipment Safely



Do not place this product on an unstable cart, stand, bracket, or table. The product may fall, causing serious injury and serious damage to the product. Use only with a cart, stand, bracket or table recommended by Ericsson.

An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn. Do not move or carry the equipment whilst it is still connected to the supply or other leads, is live, or is in operation.

2.3 Installing the Equipment

2.3.1 Fixing and Rack Mounting

The equipment is designed for fixed use only and has been shipped with fixing brackets suitable for a standard 19-inch rack. When installed in a rack, it should be secured using the fixing brackets. In addition, support shelves must be used to reduce the weight on the brackets. Ensure it is firmly and safely located and it has an adequate flow of free-air. *Figure 2.1* shows the recommended positioning and spacing between units to ensure good airflow when multiple units are installed in a 600 x 600 mm rack with free airflow, or an 800 x 800 mm with forced-air cooling.

Slide the unit onto the chassis supports and affix to the rack by means of an M6 x 18 mm panhead screw in each corner.

A freestanding unit should be installed on a secure horizontal surface where it is unlikely to be knocked or its connectors and leads disturbed.

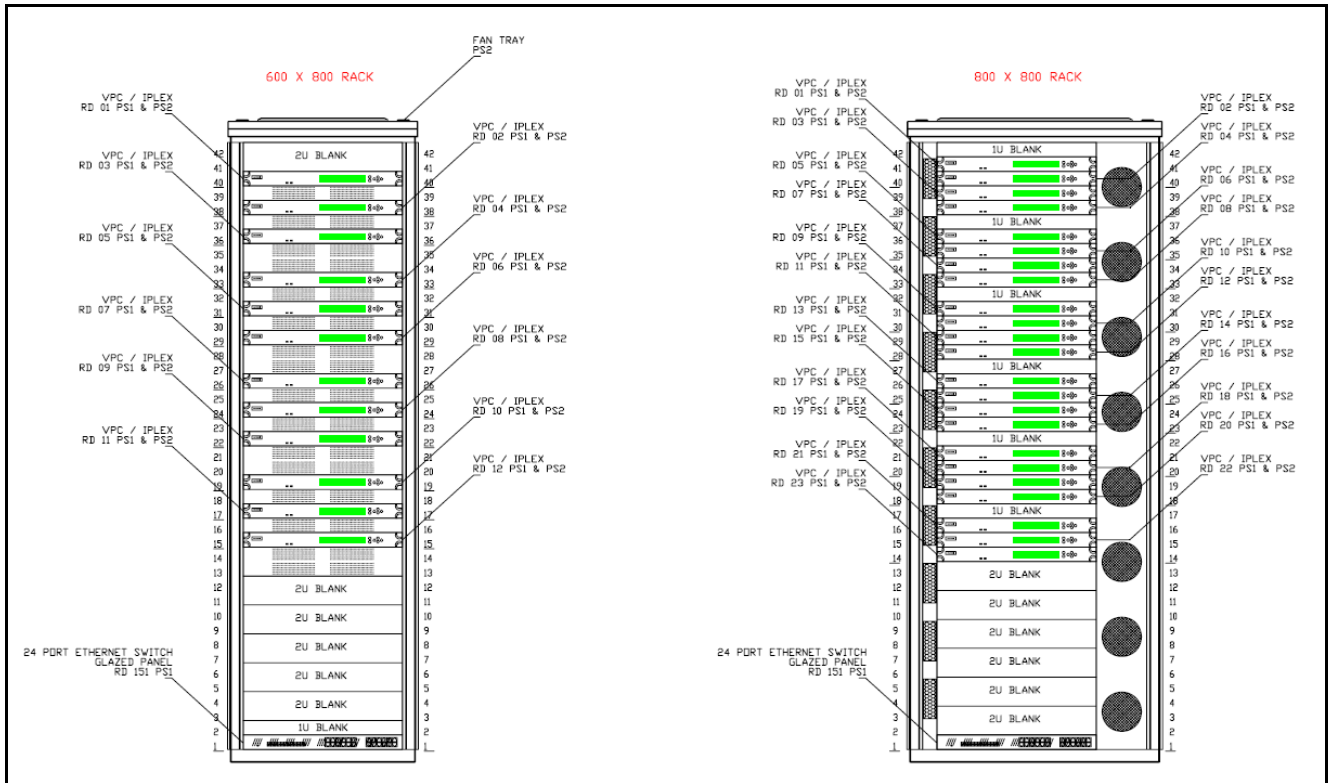


Figure 2.1 Recommended Rack Mount Positioning and Spacing

2.3.2 Ventilation

2.3.2.1 Openings in the Covers

Side openings in the unit, as well as side-mounted cooling fans, are provided for ventilation. They ensure reliable operation of the product and protect it from overheating. The openings of the fans must not be blocked or covered.



Figure 2.2 Air-Flow through the Equipment

2.3.2.2 Care in Positioning



Cautions!

The fans contained within this unit are not fitted with a dust/insect filter. Pay attention to the environment in which it is to be used.

Do not install units so that the air intake of one aligns with the outlet on another. Provide baffles and adequate spacing.

The equipment should never be placed near or over a radiator or other source of heat. It should not be placed in a built-in installation such as a rack unless proper ventilation is provided and the instructions have been adhered to.

Allow at least 40 mm free air-space at each side of the equipment to ensure adequate cooling. Racks containing stacked equipment may need to be forced air-cooled to reduce the ambient temperature within the rack.

2.3.2.3 Protection from Moisture

Do not install this equipment in areas of high humidity or where there is a danger of water ingress.

2.3.3 Installing Cables - Safety

Power supply cables should be routed so that they are not likely to be walked on or pinched by items placed upon or against them. Pay particular attention to cables at plugs, convenience receptacles, and the point where they exit from the appliance.



Warnings!

Do not run AC power cables in the same duct as signal leads. Do not move or install equipment whilst it is still attached to the mains supply. Ensure safety and ESD precautions are observed while connecting equipment.

2.4 EMC Compliance Statements¹

2.4.1 EN 55022/CISPR22

This is a Class A product. In a domestic environment this product may cause radio interference in which case the User may be required to take adequate measures.

2.4.2 FCC

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the Reference Guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the User will be required to correct the interference at ones own expense.

2.5 AC Supply Operation

An AC power supply is provided with models SPR11/CHASSIS/1AC and SPR11/CHASSIS/2AC.

2.5.1 AC Power Supply

The equipment operates from a wide-ranging mains power supply (100-240 V AC 50/60 Hz nominal) and is designed for use in ambient air temperature in the range 0°C to +50°C. There are no links etc. to be altered for operation from different supply voltages. The full Technical Specification is given in *Annex B, Technical Specification*.



Warnings!

The SPR1100 Stream Processor should only be operated from the type of power source indicated on the marking label. If you are not sure of the type to your business, consult your appliance dealer or local power company. Do not overload wall outlets and extension cords as this can result in a risk of fire or electric shock.

The SPR1100 Stream Processor is NOT fitted with an AC power ON/OFF switch. Ensure the supply socket outlet is installed or located near the equipment so that it is accessible.

¹ The EMC information was correct at the time of manufacture.

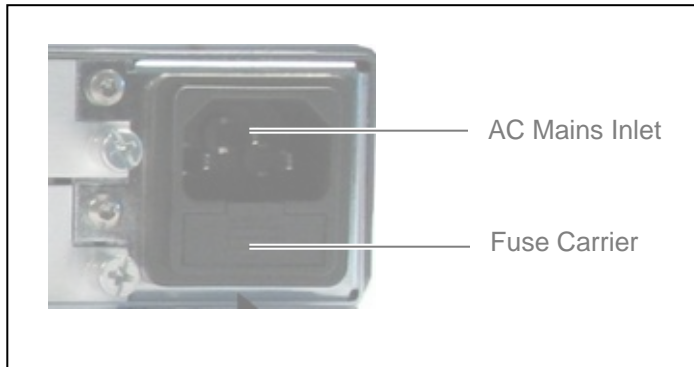


Figure 2.3 AC Power Inlet Assembly

Note: See *Annex B, Technical Specification* for fuse information.

2.5.2 AC Power Supply Cord

2.5.2.1 General

A two-meter mains supply cord is supplied with this product. It is fitted with a molded plug suitable for the USA, UK or mainland Europe as advised at the time of ordering.

Note: The equipment is not fitted with an AC power supply ON/OFF switch. Ensure the socket-outlet supplying the equipment is installed near the equipment so that it is easily accessible.

2.5.2.2 Wire Colors

The wires in the supply cord are colored as shown in *Table 2.1*.

Table 2.1 Supply Cord Wiring Colors

	UK (BS 1363)	EUROPE (CEE 7/7)	USA (NEMA 5-15P)
Earth:	Green-and-yellow	Green-and-yellow	Green
Neutral:	Blue	Blue	White
Live:	Brown	Brown	Black

If the colors do not correspond with the colored markings identifying the terminals in a locally supplied plug, proceed as in *Annex B*. The inclusion of *Table 2.2* is for reference.

Table 2.2 Non Standard Supply Cord Wire Colors

Wire Color (UK)	Action
green-and-yellow	...must be connected to the terminal in the plug which is marked with the letter E or the safety earth symbol \perp or colored green or green-and-yellow.
blue	...must be connected to the terminal in the plug which is marked with the letter N or colored black.
brown	...must be connected to the terminal in the plug which is marked with the letter L or colored red.

2.5.3 Connecting the Equipment to the AC Power Supply

As there is no mains power switch fitted to this unit, ensure the local ac power supply is switched OFF before connecting the supply cord.

Connect the mains lead to the equipment and then to the local supply.

2.6 DC Power Operation

A –48 V DC power supply is provided with models SPR11/CHASSIS/1DC and SPR11/CHASSIS/2DC.

2.6.1 DC Power Supply



Cautions!

This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your business, consult a qualified electrical engineer.

This equipment is Class 1 and must have a protective earth.

This product uses a –48 V DC power supply source (see *Annex B, Technical Specification*) for a full power supply specification.

This equipment may be fitted with either a connector that has an **integral fuse with wiring terminals** (see *Figure 2.4*) or a **dedicated 3-pin connector without a fuse** (see *Figure 2.5*). For both types of connector, for protection of the DC wiring, a circuit breaker of maximum 16 A is recommended.

For wiring DC power, a minimum wire size of 1.0 mm² (17AWG) is recommended. This may need to be increased for longer cable runs.

2.6.2 Location of the DC Input Connector

The connector is located at the right-hand rear of the equipment.



Warning!

The -48 V DC unit is not fitted with an ON/OFF switch. Ensure that the supply has a suitable means of isolation that is easily accessible. Failure to isolate the equipment properly may cause a safety hazard.

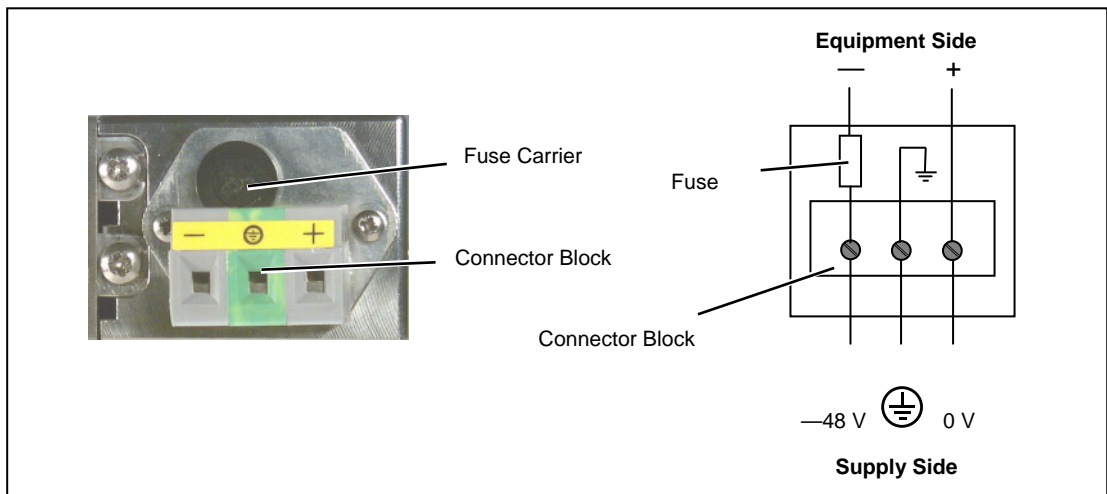


Figure 2.4 Connector Block for -48 V DC Input

In the connector, shown above, the equipment fuse is held in an integral fuse carrier at the DC power inlet at the rear of the unit. See *Annex B, Technical Specification* for DC fuse information.

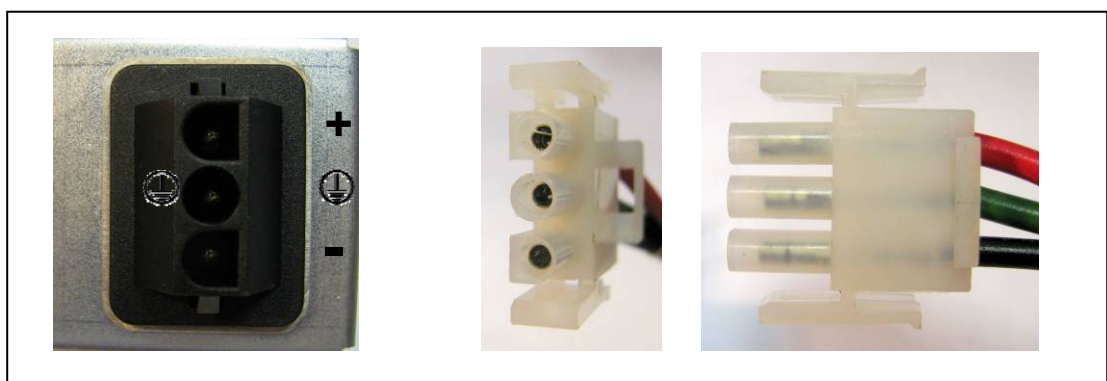


Figure 2.5 Connector Block for -48 V DC Input (Without Fuse)

2.6.3 DC Connector Details

For connection to the –48 V input connector (shown in *Figure 2.4*) the following parts from AMP or Molex should be used:

AMP Universal MATE-N-LOK

Housing: AMP no. 1-480700-0

Female terminal (3 needed per housing): AMP no. 926901-1

Molex MLX

Housing: Molex no. 50-84-1030

Female terminal (3 needed per housing): Molex no. 02-08-1002

2.6.4 Connection Cable Color Coding

The DC input cable supplied with the product is color coded in accordance with the following.

Table 2.3 DC Connector Wire Colors

Earth	Green-and-yellow
–48 V	Blue
0 V	Brown

2.6.5 Connecting the Unit to a DC Power Supply

Note: This equipment is not intended for direct connection to centralized DC power systems in the USA or Canada.

Connect the SPR1100 to the local DC power supply as follows.

1. **Local DC Power Supply** - Ensure the local DC supply is isolated.
2. **SPR1100** - Ensure circuit protection of a suitable value (e.g. a fuse) is fitted to the product supply wiring.
3. **Supply Cord** - Connect the DC lead to the unit input connector and then to the local DC power supply. Switch on the DC power supply.

2.7 Protective Earth/Technical Earth



Warnings!

This unit must be correctly earthed through the molded plug supplied; if the local mains supply does not have an earth conductor do not connect the unit. Contact Ericsson Customer Services for advice.

Before connecting the unit to the supply, check the supply requirements in Annex B.

The terminal marked \perp at the rear panel is a Technical Earth. Its use is recommended. This is NOT a protective earth for electric shock protection. The terminal is provided to:

1. Ensure all equipment chassis fixed within a rack are at the same technical earth potential.
2. Eliminate the migration of stray charges when connecting between equipment. To do this, connect a wire between the Technical Earth terminal and a suitable point on the rack.

The Technical Earth provides a suitable connection between the equipment and the installation to give a low impedance path at normal operating frequencies.

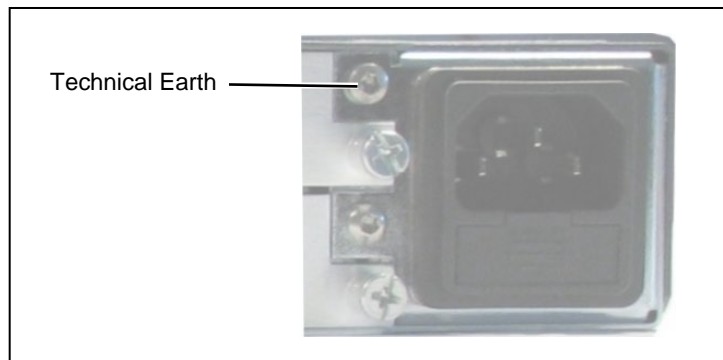


Figure 2.6 Position of Technical Earth

2.8 Signal Connections

2.8.1 General



Caution!

It is strongly recommended that the terminal marked \perp at the rear panel of the equipment is connected to a site Technical Earth before any external connections are made and the equipment is powered. This limits the migration of stray charges.

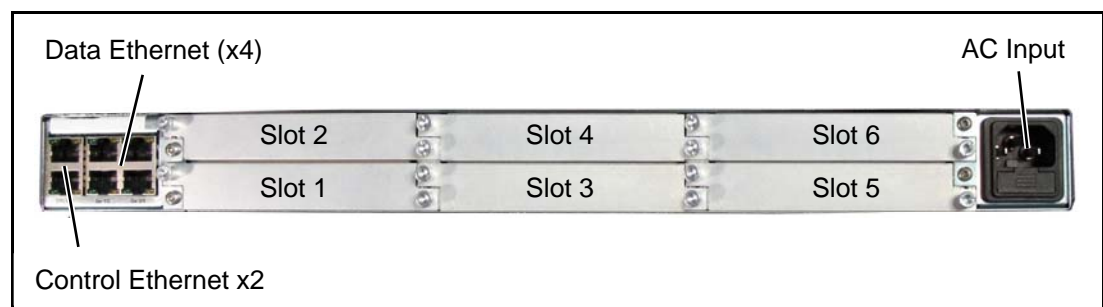


Figure 2.7 Typical SPR1100 Rear Panel (model shown SPR11/CHASSIS/1AC)

2.8.2 Data Ethernet Connector

The unit has four Ethernet ports - two for data input, and two for data output and will respond to ARPs, pings and other low-level Ethernet traffic. The ports are accessible via RJ-45 connectors on the rear panel of the chassis. These are labeled Ge 1, Ge 2, Ge 3 and Ge 4. Ge 1 and Ge 2 are used for data input, while Ge 3 and Ge 4 are data output.

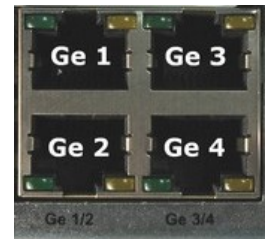


Table 2.4 Data Ethernet Connector

Item	Specification
Connector type	RJ-45 (100/1000BaseT)
Connector designation	Ge 1 /2 Ge 3 /4
Pin outs (Unused pins are not connected)	Pin 1 - Tx Out(+) Pin 2 - TX Out (-) Pin 3 - Rx In (+) Pin 6 - RX Out (-)

2.8.3 Control Ethernet Connector

The Ethernet control ports are used to connect the equipment to a PC for access with a web browser.

Both connectors share the same IP address, Ctrl 1 is the Primary control port, and is by default the active control port. Control Port Ctrl 2 should be considered as the secondary control network as it will not respond to the Control Port IP Address unless control has been passed to it either as a result of a redundancy switch, or via a user command. The active control port switches when Ctrl 1 has no link (e.g. carrier), and Ctrl 2 has the link.



Table 2.5 Control Ethernet Connector

Item	Specification
Connector type	RJ-45 (100/1000BaseT)
Connector designation	Ctl 1/2
Pin outs (Unused pins are not connected)	Pin 1 - Tx Out(+) Pin 2 - TX Out (-) Pin 3 - Rx In (+) Pin 6 - RX Out (-)



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Getting Started

Chapter 3

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3.1 Introduction

Due to the number of different ways the SPR1100 can be used, it is impossible to give precise setting up instructions for every possible working scenario. This chapter, therefore, gives general guidance and principles on how to power up and set up your unit for operation and describes the more common operations you will want to perform.

For details of all Front Panel menus and controls, see *Chapter 4, Front Panel Control*. For details of all Web Graphical User Interface (GUI) menus and controls, see *Chapter 5, Web GUI Control*.

For more information on possible networking scenarios, see *Chapter 6, Stream Processing and Networking*.

3.2 How to Connect Up the Unit

See *Chapter 2, Installing the Equipment* for all connector details.

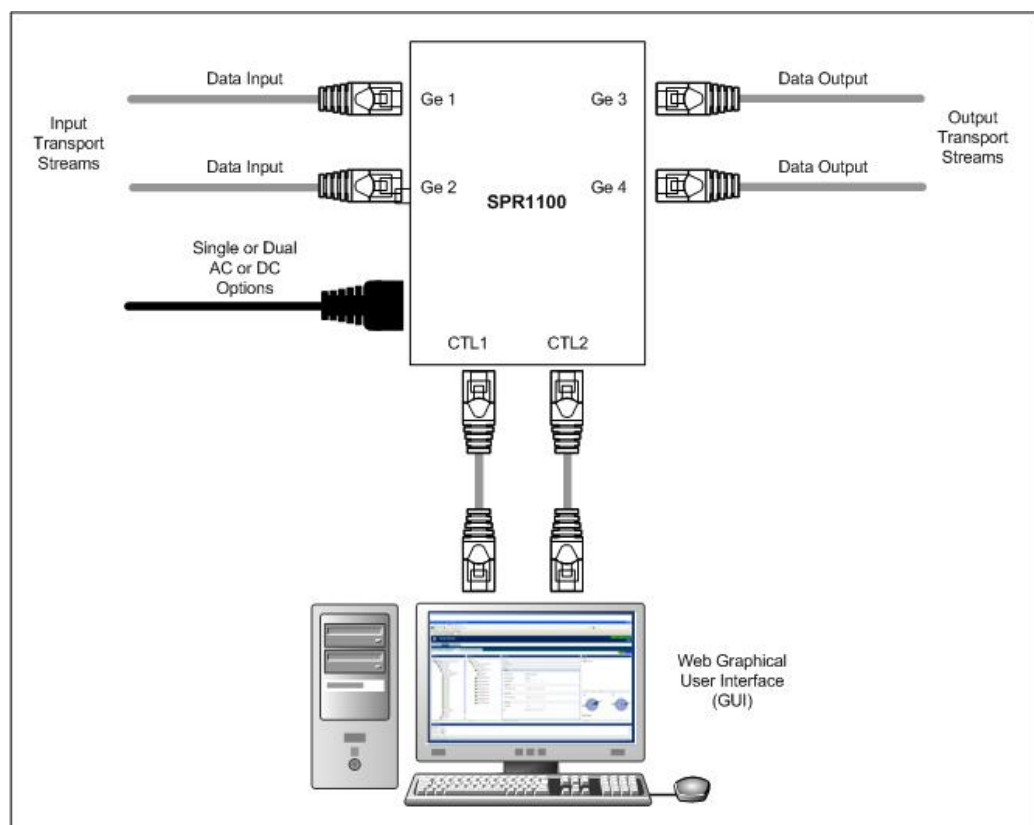


Figure 3.1 SPR1100 Connections

To connect up the unit(s):

1. Connect signal input connectors Ge 1 and Ge 2 (for your input Transport Streams) to your local area network.

2. Connect signal output connectors Ge 3 and Ge 4 (for your transcoded output Transport Streams) to your local area network.
3. Connect computer control connectors CTL 1 and CTL 2 (for Web GUI Control) to your local area network. Both connectors share the same IP address, Ctrl 1 is the Primary control port, and is by default the active control port. Control Port Ctrl 2 should be considered as the secondary control network as it will not respond to the Control Port IP Address unless control has been passed to it either as a result of a redundancy switch, or via a user command. The active control port switches when Ctrl 1 has no link (e.g. carrier), and Ctrl 2 has the link.
4. Connect AC power connector, depending on the option purchased, to the power supply.

3.3 How to Power Up the Unit

To power up the unit(s):

1. With all signal and power cables connected as required, switch on the AC power supply, depending on the model, to the unit at the wall or rack outlet.
2. Wait for unit initialisation to complete (approximately 1.5 minutes, depending on the number of options fitted in the unit).



Caution!

This equipment should not be operated unless the cooling fans are working and there is free-air flow around the unit.

Note: The SPR1100 Stream Processor does NOT contain a power on/off switch.

3.4 How to Set the Unit IP Address

Setting the IP address of a unit is accomplished using the front panel menus. For a full description of these menus, see *Chapter 4, Front Panel Control*.

To set the IP address of the unit(s):

1. On the SPR1100 front panel, press the ► (Forward) pushbutton until the current IP address is displayed. Press the **Edit** key and then use the ▲ (Up), ▼ (Down), ► (Forward) and ◀ (Back) keys to enter the IP address.

Note: The ► (Forward) and ◀ (Back) keys move the cursor between characters and the ▲ (Up) and ▼ (Down) keys increase/decrease the number selected by the cursor. A key is illuminated when there is functionality available. If a key is not illuminated, pressing it will have no effect.

2. Press the **Save** button to store the new IP address.

3. Continue and set the subnet mask and gateway address in the same way, if required, using the front panel keys as described above to modify each parameter.

IP Addresses on the unit must adhere to RFC3330 range of restrictions as listed in the following table of allocated IP addresses.

Table 3.1 IP Address Restrictions

Block	Present Use	Reference
0.0.0.0/8	This Network	[RFC1700, p4]
10.0.0.0/8	Private-Use Networks	[RFC1918]
14.0.0.0/8	Public-Data Networks	[RFC1700, p181]
24.0.0.0/8	Cable Television Networks	---
39.0.0.0/8	Reserved but subject to allocation	[RFC1797]
127.0.0.0/8	Loopback	[RFC1700, p5]
128.0.0.0/16	Reserved but subject to allocation	---
169.254.0.0/16	Link Local	---
172.16.0.0/12	Private-Use Networks	[RFC1918]
191.255.0.0/16	Reserved but subject to allocation	---
192.0.0.0/24	Reserved but subject to allocation	---
192.0.2.0/24	Test-Net	---
192.88.99.0/24	6 to 4 Relay Anycast	[RFC3068]
192.168.0.0/16	Private-Use Networks	[RFC1918]
198.18.0.0/15	Network Interconnect Unit Benchmark Testing	[RFC2544]
223.255.255.0/24	Reserved but subject to allocation	---
224.0.0.0/4	Multicast	[RFC3171]
240.0.0.0/4	Reserved for Future Use	[RFC1700, p4]

Note: The control network and data networks should not conflict. It is suggested that the ranges for these networks are in the Private-Use Networks as listed in the summary Table. IP Address range 192.168.10.x (subnet 255.255.255.0) is used for internal unit communications, so should not be used for external communications.

3.5 How to Import Multiple Transport Streams/Input Services

The unit is configured using the web browser Graphical User Interface (GUI). For details of all the GUI screens and options, see *Chapter 5, Web GUI Control*.

If you have the details of multiple Transport Streams available as a spreadsheet (.xls) or a text file (.txt), you can quickly populate your unit with this information. See *Chapter 1, Introduction* for a list of the supported transcoding permutations.

To import multiple Transport Streams/Input Services:

1. Navigate to the **Configure > Services** screen of the web GUI.
2. Right-click on the **Host Inputs** icon and select the **Import Transport Streams** option from the displayed drop-down menu.

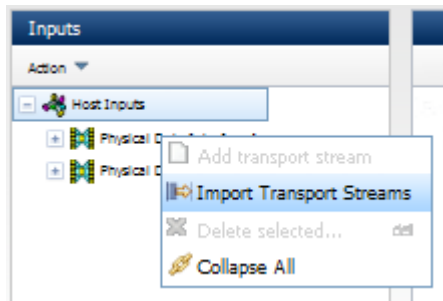


Figure 3.2 Import Transport Streams Menu Option

3. A dialog will be displayed enabling you to download a template, either as a spreadsheet (.xls) or a text file (.txt).

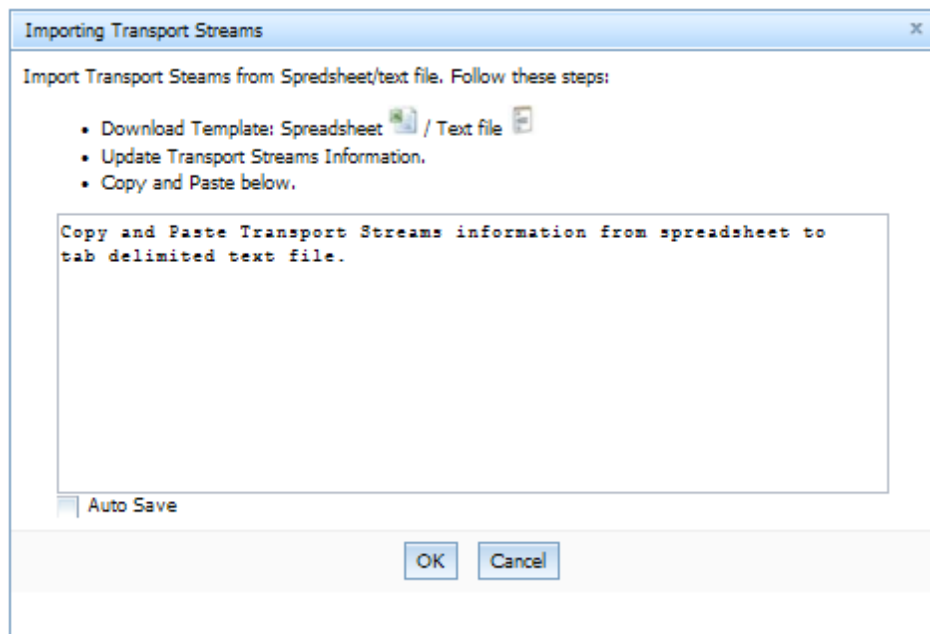


Figure 3.3 Import Transport Streams Pop-Up Window

4. This template can be edited on your computer to incorporate the streams desired. When editing is complete, the data can be pasted back into the pop-up window. **Ensure that the TAB characters are preserved in the data during this process.**
5. Click the **OK** button to transfer the data to the **Inputs** panel or click **Cancel** to abort the operation. If the **Auto Save** box is checked, the SPR1100 will be updated immediately on import.

3.6 How to Create/Add a Transport Stream/Input Service

In order to use the SPR1100 you will need a minimum of one Transport Stream and will need to define an Input Service and associated profiles. If you don't have your Transport Stream details saved as a file to be downloaded (described above), you will need to set them up individually.

To set up/add a Transport Stream/Input Service:

1. Navigate to the **Configure > Services** screen on the web GUI.
2. On the **Input** pane **Action** menu, highlight **Physical Data Interface 1** and select **Add Transport Stream**. This will create a new input stream.

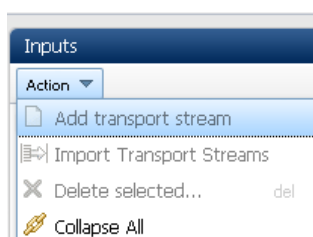


Figure 3.4 Add Transport Streams Menu Option

3. Enter the IP details in the **Properties** pane of the **Transport Stream** accordion and click **Apply All** button.

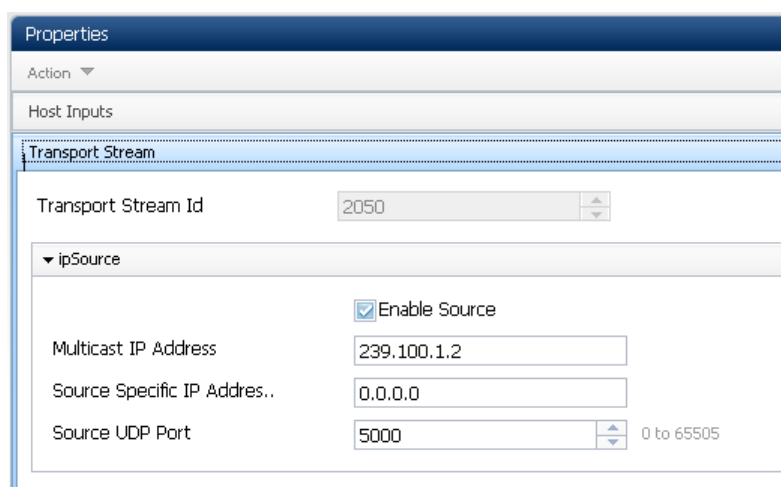


Figure 3.5 Transport Streams Settings

4. The unit will now attempt to acquire the Transport Stream on that IP address (either multicast or unicast). It may take up to 30 s to properly acquire all services and components within the Transport Stream.
5. When acquired, the Input Service will be displayed in the **Inputs** pane. Click to expand the list and view the associated video, audio and data Profiles.

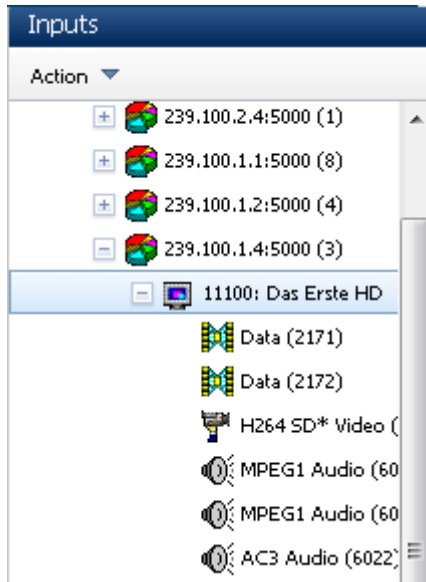


Figure 3.6 Input Service and Profiles

3.7 How to Create an Output Service

When you have set up your Input Services you will need to set up the corresponding Output Services, which may or may not contain the same Profiles. To enable you to do this quickly, the SPR1100 supports **drag-and-drop** operation between the Input and Output panes.

To set up an Output Service:

1. From the **Configure > Services** screen on the web GUI, select and drag an Input Service to the Output pane. A dialog will be displayed.

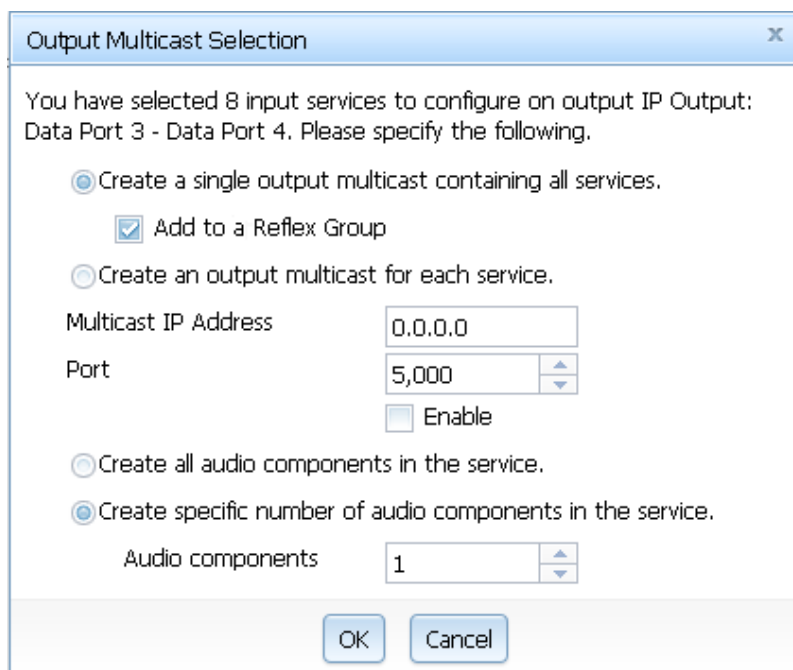


Figure 3.7 Specifying an Output Service

2. Enter the details of the Output Service, as required, in the Output Multicast Selection dialog. This will create an output service with the default set of profiles:
 - a Specify whether to create a single output multicast, or a separate multicast or each service.
 - b If you select single output multicast, by default a Reflex group is created and all the services are created within this Reflex group. The maximum number of services in a single Reflex group is 24. Uncheck the **Add to a Reflex Group** box if you do not want a Reflex group created. You can create the group later, if desired.
 - c Create an output multicast for each service by entering the relevant IP settings for the output streams.
 - d Create audio components as required.
 - e Click the **OK** button to accept the new settings or click **Cancel** to abort the operation.
3. You can now edit the service and component Profiles using the Properties pane, described in Chapter 5 Web GUI Control. Remember that any settings that you edit in the Properties pane will not be sent to the unit and activated until you click the Apply All button.
4. Important: the input video format (HD or SD) is NOT detected automatically; therefore, you **MUST** manually select the correct video input format in the Input tab of the Video Reflex Component accordion.

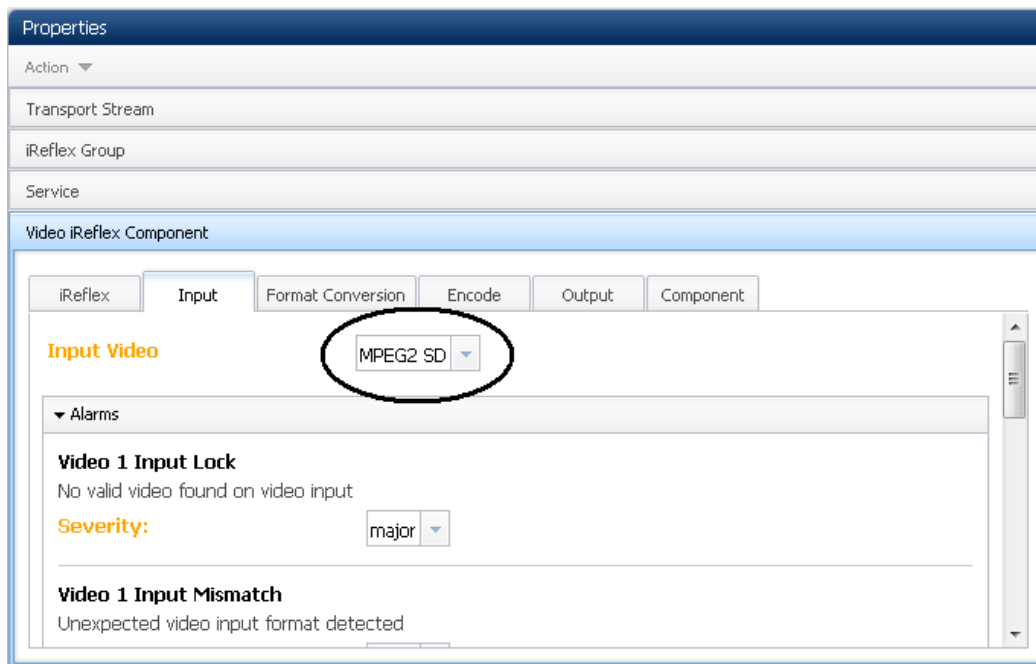


Figure 3.8 Specifying Input Video Format

5. The service and profile properties may now be specified using the **Service Properties** tab on the **Service** accordion.

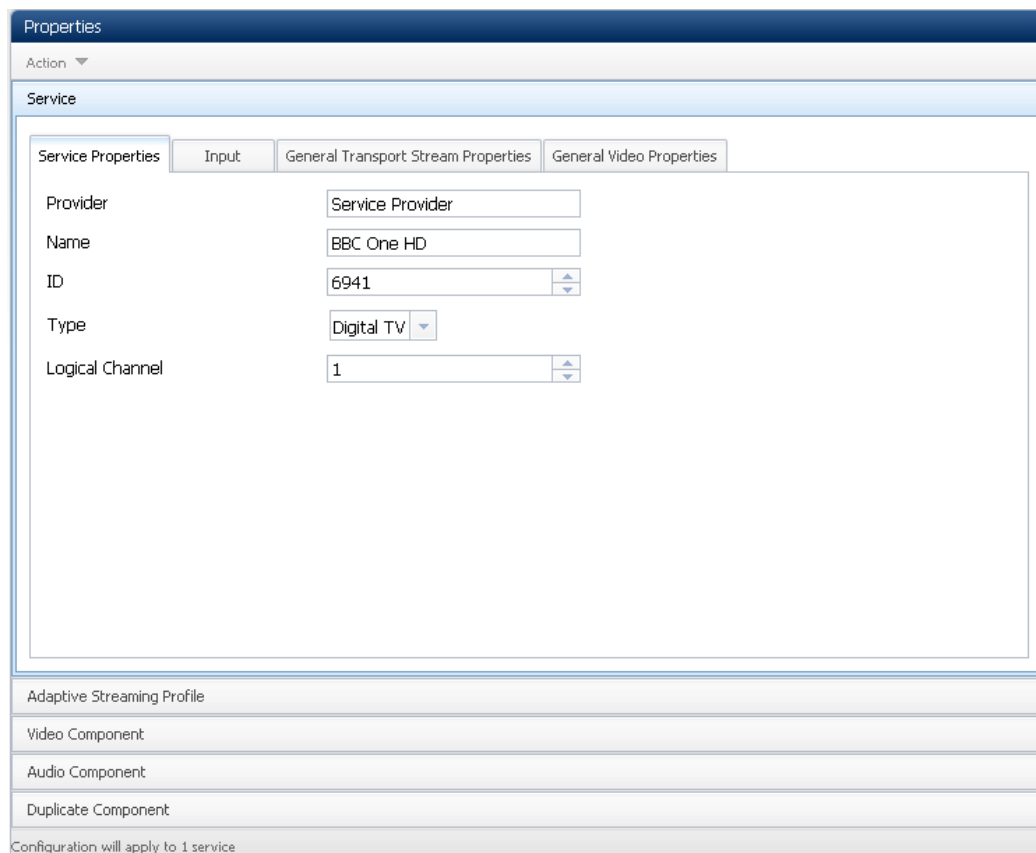


Figure 3.9 Specifying Service and Profile Properties

3.8 How to Set Up Reflex on an Output Transport Stream

About Reflex

Reflex is the statistical multiplexing system provided by Ericsson. Reflex on the SPR1100 operates completely within the unit and does not require an external controller. A single output Transport Stream can be configured so that each service varies its bit rate dynamically according to the complexity of the video frames.

Reflex works on a group of components (called a Reflex group), and monitors the bit rate demand of each component within the group on a frame-by-frame basis. It automatically adjusts the bit rate allocated to each component to ensure that the picture quality is optimized.

The ability to create output Reflex groups does not depend on the whether the input service was originally part of a reflex group – both CBR video and VBR video input elementary streams can be converted to Reflex at the output.

The following limitations apply:

- Maximum number of Reflex groups per SPR1100: 18
- Maximum number of services per Reflex group: 24
- Maximum number of output services across all groups: 72 (SD) OR 24 (HD).

A Reflex group can use the available bit rate within a Transport Stream, or it can have a manually set bit rate. Either way, the sum of the bit rates of the components within the group cannot exceed the Reflex group bit rate

Reflex does not require an external control entity for correct operation. As a trade-off, Reflex can only control the bit rates of internally generated components.

Reflex requires a valid SPR/SWO/IREFLEX license for each reflex group that is created.

Creating Reflex Support

You can set up a Reflex Group when you initially create the output (see section 3.7 *How to Create an Output Service*), or subsequently, by manually creating the Reflex group on an empty output Transport Stream and manually dragging services into it.

Setting up Reflex Group Parameters

Once all the components to be statistically multiplexed are added to the Reflex group, you can set up the group parameters.

To set up the Reflex Group parameters:

1. In the **Outputs** widget, select the Reflex group you want to set up.
2. In the **Properties** widget, set a name for the group in the **Group Name** field.

3. For seamless buffer delay, specify the **Video Delay** your application can tolerate.

See *Chapter 5, Web GUI Control* for details of the **Properties** widget.

3.9 How to Change Settings across Multiple Profiles and/or Services

This is useful when you want to change a single setting, e.g. Audio bit rate, and want it to affect some, or all, current output services.

In general, changing a setting in the properties pane will apply to all entities at or below the current selection in the Outputs pane. This is best illustrated by an example.

Examples:

To change the audio bit rate for all your output services:

1. On the **Configure > Services** screen, select the **IP Output Data Port** in the **Outputs** pane.
2. Select the **Audio Component** accordion. Notice that the bottom of the **Properties** pane states how many audio components this will actually apply to.
3. Select the **Encode** tab and change the bit rate.
4. Click **Apply All** to set the bit rate across all your Output Services.

A similar effect can be achieved by using **Ctrl-click** to select multiple entities in the **Outputs** pane, e.g. to change the video bit rate of all your 1280x720 profiles.

1. Expand all your services in the **Outputs** pane.
2. Hold **Ctrl** key down and highlight all the 1280x720 profiles.
3. Expand the **Video Component** tab in the **Properties** pane.
4. Select the **Encode** tab and set the bit rate.
5. Click **Apply All** to set the bit rate across all your selected profiles.

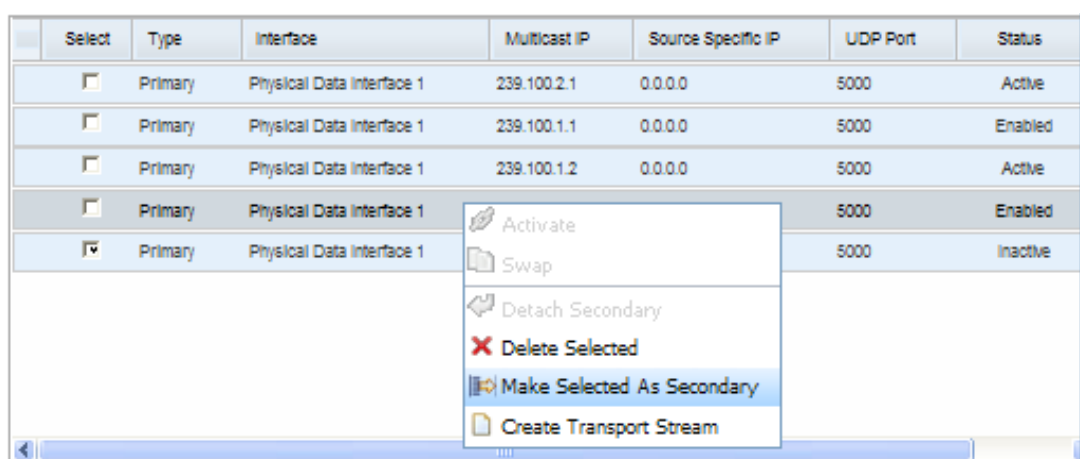
3.10 How to Make a Secondary Input

This is used when you want to make one of the inputs a Secondary (backup) for a particular Primary input. This Secondary multicast input can be on the same physical data interface or on the other physical data interface. Once this has been set up then if the Primary TS fails then the Secondary will be switched into its place.

Note: This is only useful if the Secondary has exactly the same line up of services as in the Primary.

To make a Secondary Input:

1. From the **Configure > Services** page and click the **Host Inputs** icon in the **Inputs** pane.
2. Tick the **Select** checkbox of the required Transport Stream.
3. Right-click on the Transport Stream to display a context menu and select the **Make Selected As Secondary** option.



Select	Type	Interface	Multicast IP	Source Specific IP	UDP Port	Status
<input type="checkbox"/>	Primary	Physical Data Interface 1	239.100.2.1	0.0.0.0	5000	Active
<input type="checkbox"/>	Primary	Physical Data Interface 1	239.100.1.1	0.0.0.0	5000	Enabled
<input type="checkbox"/>	Primary	Physical Data Interface 1	239.100.1.2	0.0.0.0	5000	Active
<input type="checkbox"/>	Primary	Physical Data Interface 1			5000	Enabled
<input checked="" type="checkbox"/>	Primary	Physical Data Interface 1			5000	Inactive

Figure 3.10 Make Selected as Secondary

3.11 How to Configure Manual Redundancy

This is useful when if you want to move to your Secondary input because you are going to intentionally disrupt/remove the Primary input for planned maintenance, re-routing etc. You may also use this facility to test that your Secondary system is working correctly.

Note: These actions are normally performed during a maintenance window.

A manual switch between the Primary and Secondary can be selected by right clicking on the Secondary stream, and selecting **Activate**. Secondaries may only be activated if they contain services used in current transcode operations.

Note: This function takes effect immediately. The **Apply All** button is **not** required.

Select	Type	Interface	Multicast IP	Source Specific IP	UDP Port	Status
<input type="checkbox"/>	Primary	Physical Data Interface 1	239.100.2.1	0.0.0.0	5000	Active
<input type="checkbox"/>	Primary	Physical Data Interface 1	239.100.1.1	0.0.0.0	5000	Enabled
<input type="checkbox"/>	Primary	Physical Data Interface 1	239.100.1.2	0.0.0.0	5000	Active
<input type="checkbox"/>	Primary	Physical Data Interface 1	239.100.1.3	0.0.0.0	5000	Enabled
<input type="checkbox"/>	Secondary	Physical Data Interface 1	239.100.1.4	0.0.0.0	5000	Inactive

Activate
 Swap
 Delete Selected
 Create Transport Stream

Figure 3.11 Host Input Pane showing Activate Window

Similarly, the Primary/Secondary roles can be swapped over by right-clicking either multicast and selecting **Swap**.

3.12 How to Configure a 1+1 Redundant System

A 1+1 system consists of a Primary unit and a Secondary unit.

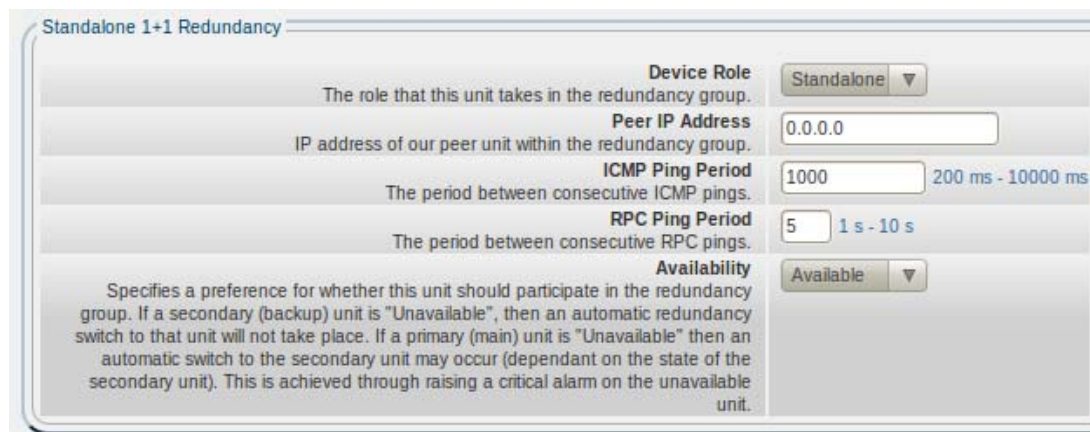
Note: It is not possible to turn a Primary unit into a Secondary unit (nor vice versa). At any one time, one unit will be the **Active** unit and one unit will be the **Passive** unit

In a 1 +1 Redundant System, automatic redundancy from the active to the passive unit is triggered by loss of Transport Stream lock or failure of the active unit. When a switch to the passive unit has taken place this unit will remain active even if the fault is cleared on the other unit. A manual revert is possible by right clicking on the primary stream and clicking **Activate**.

Note: An automatic revert is not possible.

To add a Secondary unit to a Standalone Configuration:

1. Create a backup of the Primary configuration settings just in case anything goes wrong. This can be done by clicking on **Configure > Save-Load**, then right click on the link to save the configuration.
2. Ensure that the Secondary is disconnected from the network, and apply power to the Secondary unit.
3. Configure the control IP address for the secondary unit using the front panel.
4. Connect the Secondary to the control network. Do not connect the data networks at this point.
5. Open the Web GUI for the Secondary unit and configure the remaining network settings (control, data input and data output).
6. On the Secondary Web GUI click **Configure > System > Standalone 1 + 1 Redundancy**. Enter the control IP address of the Primary in the **Peer IP Address** setting and click **Apply Changes**, then **OK** on the popup dialog.



Standalone 1+1 Redundancy

Device Role
The role that this unit takes in the redundancy group. Standalone ▼

Peer IP Address
IP address of our peer unit within the redundancy group.

ICMP Ping Period
The period between consecutive ICMP pings. 200 ms - 10000 ms

RPC Ping Period
The period between consecutive RPC pings. 1 s - 10 s

Availability
Specifies a preference for whether this unit should participate in the redundancy group. If a secondary (backup) unit is "Unavailable", then an automatic redundancy switch to that unit will not take place. If a primary (main) unit is "Unavailable" then an automatic switch to the secondary unit may occur (dependant on the state of the secondary unit). This is achieved through raising a critical alarm on the unavailable unit. Available ▼

Figure 3.121 + 1 Redundancy Configuration

7. Open the Web GUI for the Primary unit and click **Configure > System > Standalone 1 + 1 Redundancy**. Enter the control IP address of the Secondary in the **Peer IP Address** setting, select **Primary** as the **Unit Role** and click **Apply Changes**, then **OK** on the popup dialog.
8. On the Primary unit Web GUI click **Set Primary Active**, then **OK** on the popup dialog.
9. On the Primary unit Web GUI click **Manual Configuration Copy From Primary to Secondary**, then **OK** on the popup dialog.
10. On the Primary unit Web GUI click **Configure > System > MGP Support**. Set **MGP Mode** to **On**, click **Apply Changes**, then **OK** on the popup dialog.
11. Wait for 60 seconds for the units to stabilize.
12. As a final check, click on the **Configure** on the Secondary Web GUI. The services configuration will be displayed. Compare this with the services configuration of the primary and make sure they are the same.
13. Connect the data networks to the Secondary unit.

3.12.1 Recommendations for 1 + 1 Redundancy

Enable MGP

It is possible for the 1 + 1 Redundancy system to have both units Active. This can happen if the control connection between the units fails. In this case the Secondary thinks the Primary has failed, and becomes Active. This could cause duplicate multicast packets on the output data network. To prevent this it is recommended that Multicast Guard Protocol (MGP) is always enabled in a 1 + 1 Redundancy system.

To enable MGP, open the Web GUI and click **Configure > System > MGP Support**. Set **MGP Mode** to **On**, click **Apply Changes**, then **OK** on the popup dialog.

Use SNTP to Synchronize Time

It is recommended that SNTP is used to ensure that the system clock on each unit reports the same time. This can be configured from the Web GUI by clicking **Configure > Unit Info** and setting the **SNTP Server** setting.

Beware of Changing the Unit State (setmode)

When redundancy switching is performed (either manual or automatic), the **Unit State (setmode)** may be changed, overriding any manual change to this configuration.

If you need to manually adjust this setting it is recommended that you set the 1 + 1 Redundancy **Availability** setting to **Unavailable** on both units prior to making any change. This will prevent the 1 + 1 Redundancy system from performing an automatic redundancy switch.

Resolving Configuration Mismatch Alarm

The configuration mismatch alarm indicates that the configuration on the 2 units may not be identical. This alarm is triggered if a configuration change is made on one unit whilst the other unit is not contactable. It is also triggered if the pairing process is unable to work out which unit should be Active. In this situation the user should manually decide which unit has the most up to date configuration.

The **Last Updated** value may be useful to determine this, however since communication was lost, this may not reflect the correct value for the other unit. You should check the Primary **Last Updated** time using the Primary Web GUI and the Secondary **Last Updated** time on the Secondary Web GUI.

When you have decided which unit has the correct configuration, you should use the corresponding button on the GUI to copy the configuration from that unit to the other unit. This will clear the alarm.

Resolving Conflicting Status Alarm

This alarm indicates that the pairing process was not able to determine which unit should be active and which unit should be passive. When this alarm is raised either both units will be Active or both units will be Passive.

Firstly you should resolve the **Configuration Mismatch** alarm (this will always accompany the **Conflicting Status** alarm).

If both units are Passive:

- If there are no problems with the Primary unit, you should use the Web GUI to make the Primary unit active.
- Otherwise use the Web GUI to make the Secondary unit active. Repair the Primary and switch back to is as soon as possible.

If both units are Active, and assuming that you have MGP enabled, MGP will decide which unit is actually broadcasting and suppress the data output of the other unit.

You should determine which unit is actually broadcasting and make that the Active unit. To do this, open the Web GUI for each unit (in separate browser tabs/windows) and click **Configure > System > MGP Support** on each Web GUI.

Observe the value of **Unit Level MGP State** on each unit. One of the units will show **R1 On air**. Use the web GUI to make this unit the Active unit. If you have just made the Secondary the Active unit, you should switch back to the Primary when it will cause the least disruption to your broadcasting services.

3.13 How to Apply or Discard Configuration Changes

All modifications to a configuration initially only appear in the GUI. All changes made to Service and Profile properties are highlighted as orange text to enable you to see the changes at a glance.

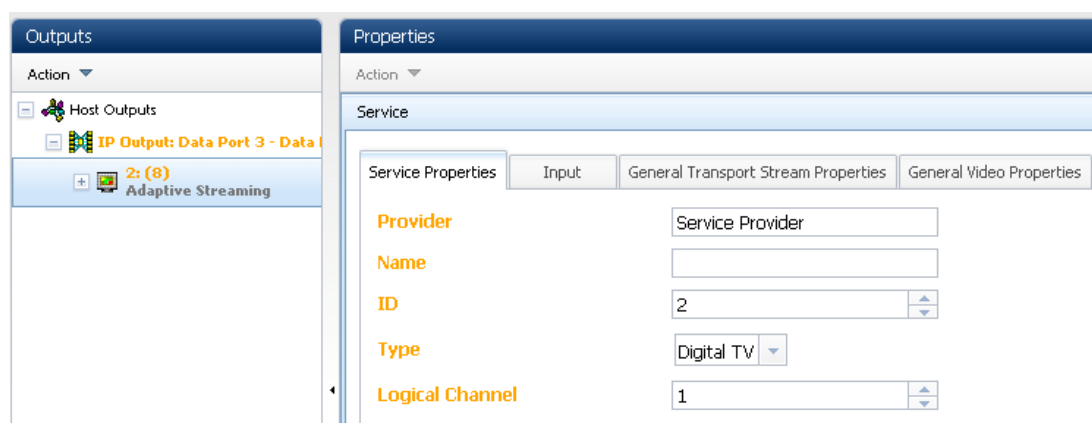


Figure 3.13 Property Changes Highlighted in Orange

All changes you have made are listed at the bottom of the screen in the Information Pane. These entries are linked so that by clicking on them the **Properties** pane will also display the relevant changes.



Figure 3.14 Changes Listed in the Information Pane

The unit does not accept any changes to the properties until the **Apply All** button is clicked.



Figure 3.15 Apply All and Discard All Buttons

Note: Changing the configuration may cause output glitching. This is kept to a minimum; transcoder units which do not need reconfiguration will not be interrupted. Additionally, changing the output bit rate will **not** cause a glitch.

Clicking the **Discard All** button displays a confirmation dialog box and abandons any changes you have made when you confirm by clicking the **Yes** button.

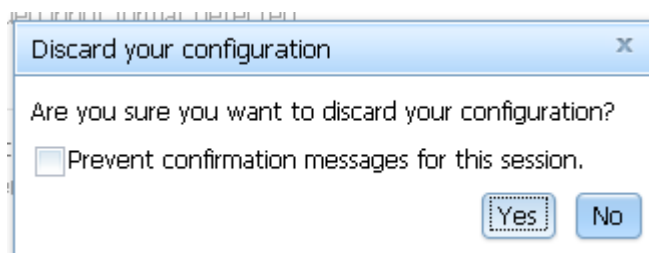


Figure 3.16 Apply All and Discard All Buttons

3.14 How to Save and Restore Your Configurations

We recommend that you save your configurations regularly, as an XML file, particularly when changes have been made. This can then be used to archive your settings for Transport Streams, Services and Profiles, in order that you can upload them in the event that your settings have been changed or lost, or to quickly load another machine with an identical configuration. See *Chapter 5, Web GUI Control* for full details of this page.

The parameters associated with each Media Processing Module slot are stored, so that if a module is removed, and then a module of the same type is plugged in to the slot, the system will attempt to apply the previous configuration for the module in that slot.

To save your configuration:

1. Navigate to the **Configure > Save-Load** web GUI page.
2. In the **Save Configuration to File** section, right click on the **Right Click to Save Current Configuration** link.

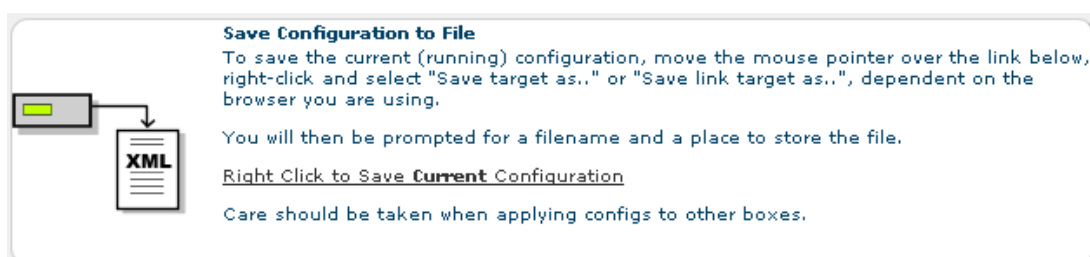


Figure 3.17 Save Configuration to File

3. Select **Save target as...** or similar (depending on the browser you are using) in the displayed dialog.
4. You will then be prompted for a file name and a location to save your file.

To restore an XML configuration file:

1. Navigate to the **Configure > Save-Load** web GUI page.
2. In the **Restore Standard Confirmation from File** section, click on the **Browse** button to locate the XML file.

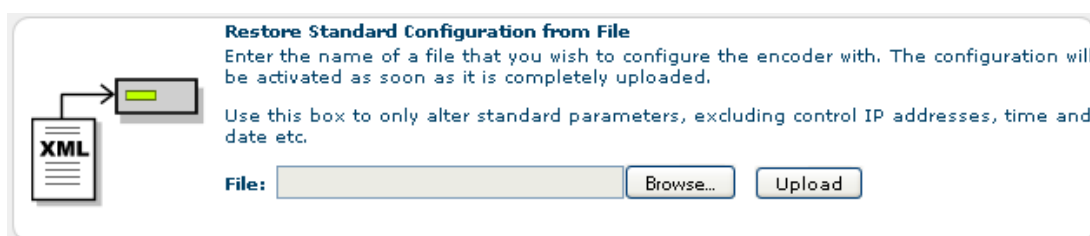


Figure 3.18 Restore Standard Configuration from File

3. Click the **Upload** button to upload the file to your unit.

4. The uploaded configuration will be actioned immediately, when completed, provided that the file is valid. In the event of an invalid file being uploaded, none of the unit settings will be changed.

3.15 How to Manage Your Resources

With the number of complex transcode configurations possible with the SPR1100, it is easy to lose track of how much of the unit's resource has been used. To help manage this, a tabbed graphical display area in the **Modules** pane on the right-hand side of the **Configure > Services** screen displays the amount of resource allocated or available for the configuration. See *Chapter 5, Web GUI Control* for full details of this page.



Figure 3.19 Allocation of Resources

Three tabs are provided: **Overview**, **Services** and **Details** which display the allocated/available breakdown for each transcode type. By hovering over the graphics on each of the tabbed pages, further details are displayed.

3.16 How to Determine the State of the Unit

When the Ericsson SPR1100 has been configured, the current state of the unit can be determined from the **Configure > Config Report** page. See *Chapter 5, Web GUI Control* for full details of this page.

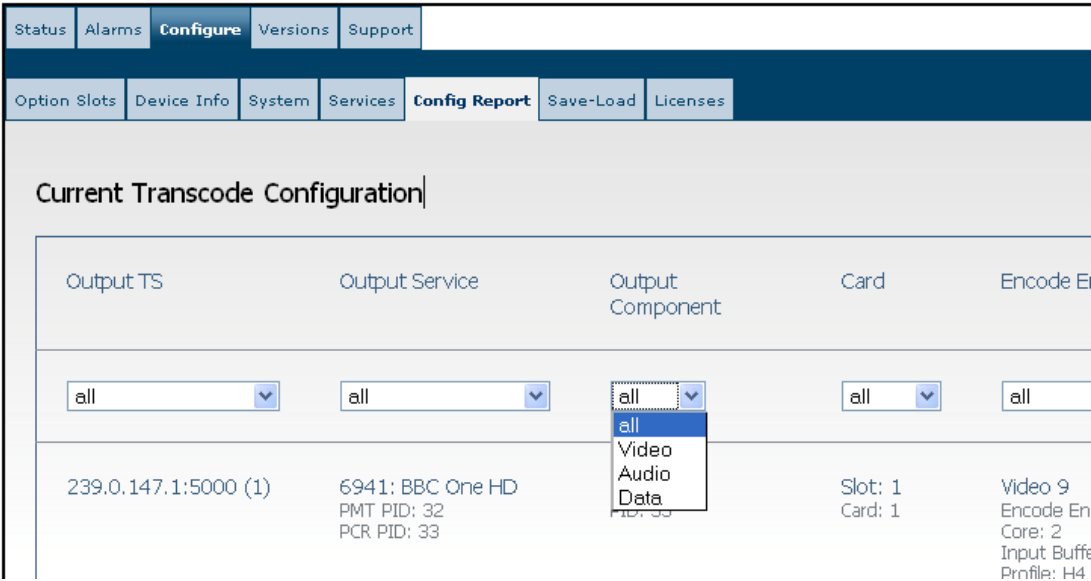


Figure 3.20 Configuration Report

The initial view shows each component of each service. The report indicates all known data about the component, and also to which card (MPM) and encode engine the component has been allocated.

The drop-down boxes towards the top of the form enable you to filter which items to view. In this way, particular components can be found rapidly and accurately, enabling stream faults to be found with ease.

3.17 How to Monitor Alarms

Front Panel Summary Alarm Indicator

A front panel LED on the SPR1100 unit provides a summary alarm indicator. See *Chapter 1, Introduction* for full details.

Front Panel LCD Alarms

The front panel LCD on the SPR1100 unit provides summary and detailed alarm indications. See *Chapter 4, Front Panel Control* for full details.

Web GUI Configuration Warnings and Errors

The **Information** pane at the bottom of the **Configure > Services** page displays **Warnings** and **Errors**, (and Change History) when you are trying to set up or edit your configuration. The entries here will alert you to operations that cannot be carried out or when you are attempting operations that will result in loss of service.

See *Chapter 5, Web GUI Control* for full details of the **Information** pane.

Web GUI Status and Alarm Monitoring Buttons

On the right-hand side of the web GUI, Status and Alarm monitoring buttons are provided:

- **Standalone** - This colored button indicates the redundancy status of the unit: either **Red** (FAIL) or **Green** (OK). When clicked, further details are displayed in a pop-up dialog. Click the **OK** button to close the dialog.
- **Alarm** – This colored button indicates the current alarm state: **Red** (CRITICAL FAILURE), **Amber** (ERRORS) or **Green** (OK). When clicked, a pop-up dialog shows details of the most recent critical alarm. Click the **OK** button to close the dialog.

See *Chapter 5, Web GUI Control* for full details of the status and alarm monitoring buttons.

Web GUI Alarms Page

The alarms status of the SPR1100 can be monitored from the **Alarms** tab web page, which lists alarms as **Red** (Critical), **Orange** (Major) or **Yellow** (Minor). Further tabs can be selected from this top level tab, which show the **Current** alarms, **History** alarms and a facility which allows the user to **Set Masks** or severity levels for individual alarms.

Time	Severity	Name	Module	Slot	Port
Tue Aug 04 12:46:48 1970	Major	Video 1 Input PCR	Video 1	Slot 1	1
Mon Aug 03 23:32:54 1970	Major	Ethernet interface Ctrl2 link down on Control network	Base Unit	Host	6
Tue Aug 04 15:30:33 1970	Major	Ethernet interface Data3 in Data Interface Group 3-4: duplicate IP detected	Base Unit	Host	3
Mon Aug 03 23:32:57 1970	Major	Ethernet interface Data4 link down in Data Interface Group 3-4	Base Unit	Host	4
Mon Aug 03 23:32:54 1970	Major	Ethernet interface Data2 link down in Data Interface Group 1-2	Base Unit	Host	2
Mon Aug 03 23:32:54 1970	Critical	HW Configuration Mismatch in slot	Base Unit	Slot 1	0
Mon Aug 03 23:32:54 1970	Critical	HW Configuration Mismatch in slot	Base Unit	Slot 2	0
Mon Aug 03 23:32:57 1970	Critical	HW Configuration Mismatch in slot	Base Unit	Slot 3	0
Mon Aug 03 23:32:57 1970	Critical	HW Configuration Mismatch in slot	Base Unit	Slot 4	0
Mon Aug 03 23:32:57 1970	Critical	HW Configuration Mismatch in slot	Base Unit	Slot 5	0
Mon Aug 03 23:32:57 1970	Critical	HW Configuration Mismatch in slot	Base Unit	Slot 6	0

Figure 3.21 Current Alarm List

See *Chapter 5, Web GUI Control* for full details of the **Alarms** tab.

See *Chapter 8, Preventative Maintenance and Fault-finding* for a description of the fault and alarm scenarios.

See *Annex E, Alarm Lists* for a list of the possible alarm messages.



Front Panel Control

Chapter 4

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4.1 Introduction

This chapter describes the features and options provided by the Front Panel menus for controlling the SPR1100 Stream Processor locally.

Note: After powering up (see *Chapter 3, Getting started*), wait for initialization to complete (approximately 1.5 to 3 minutes, depending on the number of options fitted in the chassis) before attempting to use the front panel menus and controls.

4.2 Using the Front Panel Controls

The user interface for the Front Panel consists of an alphanumeric Liquid Crystal Display, pushbuttons, and a status LED that are used to set-up, control and monitor the unit.

Various menu screens can be navigated on the LCD using the pushbuttons, which enable you to select and modify key parameters and features of the unit.

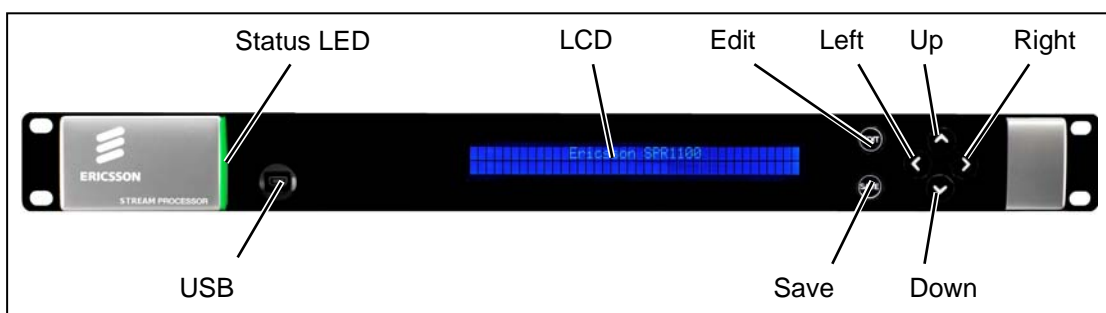


Figure 4.1 SPR1100 Front Panel

4.2.1 USB Connector

This connector is for factory / service use only.

4.2.2 Status LED

This multi-colored LED provides a visual indication of the summary status of the unit. The LED can be any one of three colors:

- **Red (Fault).** Indicates a fault condition, e.g. a missing or faulty input signal, although it may be lit briefly during power up.
- **Amber (Locked / Non-Functional)** Indicates that the unit is locked to a Transport Stream, but also indicates incorrect conditions or incorrect system functioning.

- **Green (Locked / Functional)** Indicates that the unit is locked to a Transport Stream and also indicates correct conditions and correct system functioning. There are no active alarms or active alarms or warnings are masked.

4.2.3 LCD

A 2-line x 40-character back-lit dot-matrix Liquid Crystal Display (LCD) displays various menus and settings. The menus and setting available will vary depending on which options have been enabled through the purchase of a suitable license.

See *Table 4.1* for details of all menus.

The SPR1100 has one main category of menu called the **System** Menu.

4.2.4 Arrow Pushbuttons (Up, Down, Left, Right)

Four arrow pushbuttons (or keys) are used to navigate through the front panel LCD menus. Each arrow pushbutton is backlit by an integral LED when active, indicating that a further choice or action is available by pressing that pushbutton.

▲ = Up

▼ = Down

◀ = Left (Back)

▶ = Right (Forward)

4.2.5 Edit and Save Pushbuttons

The **Edit** and **Save** pushbuttons (or keys) are used to modify and store user settings within the selected menu. The **Edit** pushbutton is backlit by an integral LED when the current menu contains an editable setting. The **Save** pushbutton is backlit by an integral LED when a change has been made that requires saving.

To edit a user setting within the selected menu:

1. Press the **Edit** key. A cursor appears (flashes) on the first line of the display.
2. If a numerical value is to be entered, use the ◀ (Back) and ▶ (Forward) keys to move the cursor along the line and select each digit in turn, and use the ▲ (Up) and ▼ (Down) keys to increment or decrement the digit.
3. If a non-numerical (mode or feature) menu item is to be selected, simply change the selection using the ▲ (Up) and ▼ (Down) keys.
4. Press **Save** to save the new setting or press **Edit** to abandon the operation and return to the original setting.

4.3 Front Panel Menus

An overview of the Front Panel menus is shown in *Table 4.1*. The menus and settings available will vary depending on which receiver model is being used and which options have been enabled through the purchase of a suitable license.

Table 4.1 Front Panel Menus

Top Level Menu To navigate to the next level of menus press the right arrow key.	Menu Level 2 To return to the top level menu press the left arrow key.	Menu Level 3 Use the up and down arrow keys to move between these menus.	Menu Level 4 Use the right arrow key and then the up and down arrow keys to move between these menus.	Description
IP address & Service name(s)	> /System	> Remote Control	> IP Address	Set IP parameters for Ethernet Control ports using the edit and up and down arrow keys.
			> Subnet Mask	Set IP parameters for Ethernet Control ports using the edit and up and down arrow keys.
			> Gateway Address	Set IP parameters for Ethernet Control ports using the edit and up and down arrow keys.
			> Default MAC Address	Set default MAC address using the edit and up and down arrow keys.
		> Alarms	> <critical>	Lists currently active alarms beginning with critical alarms, then major , etc. Use the down arrow to see all alarms menus.
		> Versions	> Software Version	The versions list gives the overall software version and build version of the unit.
		> HW Config	> Accept Option Slot Conf	This menu allows the current hardware configuration, i.e. the MPMs fitted, to be accepted as the expected hardware configuration.

4.3.1 Top-Level Menu

Shortly after power-up this menu displays the name of the unit (SPR1100) and may also display, on the line below, either the current IP Address or Service Name, if one has been set.

Ericsson SPR1100 172. 17. 117. 147

To navigate to the next level of menus press the ► (Forward) key.

4.3.2 System Menu

The functions and sub-menus within the **System** menu are used to set **Remote Control**, **Alarms**, **Versions** and **Hardware Configuration**. To access and edit the **System** menus from the top-level menu, press the ► (Forward) key. The first menu displayed is the **Remote Control** menu, described below.

4.3.3 System > Remote Control

This menu provides user settings for Remote Control. To access and edit this menu from the top-level menu, press the ► (Forward) key.

/System	Remote Control
---------	----------------

Press the ◀ (Back) key to return to the **System** main menu.

4.3.3.1 System > Remote Control > IP Address

This menu enables you to view and edit the unit IP address. To access and edit this menu from the **Remote Control** menu, press the ► (Forward) key.

To modify the IP address, press the **Edit** key. Use the ► (Forward) and ◀ (Back) keys to move between the digits and use the ▲ (Up) and ▼ (Down) keys to increment or decrement the numeric value. Press the **Save** key to save any changes or press the **Edit** key again to cancel.

/System/ Remote Control	IP Address 172. 17. 117. 147
----------------------------	---------------------------------

4.3.3.2 System > Remote Control > Subnet Mask

This menu enables you to view and edit the subnet mask. To access and edit this menu from the **IP Address** menu, press the ▼ (Down) key.

To modify the subnet mask, press the **Edit** key. Use the ► (Forward) and ◀ (Back) keys to move between the digits and use the ▲ (Up) and ▼ (Down) keys to increment or decrement the numeric value. Press the **Save** key to save any changes or press the **Edit** key again to cancel.

/System/ Remote Control	Subnet Mask 255. 255. 000. 000
----------------------------	-----------------------------------

4.3.3.3 System > Remote Control > Gateway Address

This menu enables you to view and edit the gateway address. To access and edit this menu from the **Subnet Mask** menu, press the ▼ (Down) key.

To modify the subnet mask, press the **Edit** key. Use the ► (Forward) and ◀ (Back) keys to move between the digits and use the ▲ (Up) and ▼ (Down) keys to increment or decrement the numeric value. Press the **Save** key to save any changes or press the **Edit** key again to cancel.

/System/ Remote Control	Gateway Address 192. 168. 002. 001
----------------------------	---------------------------------------

This is the last of the **Remote** sub-menus. Press the ◀ (Back) key to return to the **Remote** main menu.

4.3.3.4 System > Remote Control > Default MAC Address

This menu enables you to view and edit the default MAC address. To access and edit this menu from the **Gateway Address** menu, press the ▼ (Down) key.

To modify the default MAC address, press the **Edit** key. Use the ► (Forward) and ◀ (Back) keys to move between the digits and use the ▲ (Up) and ▼ (Down) keys to increment or decrement the numeric value. Press the **Save** key to save any changes or press the **Edit** key again to cancel.

/System/ Remote Control	Default MAC Address 00: 20: aa: 70: 1a: c0
----------------------------	---

This is the last of the **Remote** sub-menus. Press the ◀ (Back) key to return to the **Remote** main menu.

4.3.4 System > Alarms

This menu lists currently active alarms. To access and edit this menu from the **System** menu, press the ► (Forward) key.

/System	Alarms
---------	--------

Press the ▼ (Down) key to view the current alarms.

4.3.4.1 System > Alarms > (Detail)

These menus enable you to view the alarms in increasing order of severity, beginning with critical alarms, then major, etc. The severity of an alarm event may be modified using the web GUI **Alarms** web page, see *Chapter 5, Web GUI Control* for details.

To access these menus from the **Alarms** menu, press the ▼ (Down) key.

/System/ Alarms		<critical> S1 Base Unit HW Configuration Mismatch
--------------------	--	---

To view all of the current alarms, press the ▼ (Down) key to display the next alarm detail menu. Press the ◀ (Back) key to return to the **Alarms** main menu.

4.3.5 System > Versions

This menu enables you to view the software version and build number of the unit. To access this menu from the **System** menu, press the ► (Forward) key.

/System		Versions
---------	--	----------

Press the ▼ (Down) key to view the software and build versions.

4.3.5.1 System > Versions > Software Versions

This menu enables you to view the software version and build version of the unit. To access this menu from the **Versions** menu, press the ► (Forward) key.

/System/ Versions		Software Versions 6.7.0 Build 109
----------------------	--	--------------------------------------

Press the ◀ (Back) key to return to the **Versions** main menu.

4.3.6 System > HW Config

This menu allows the current hardware configuration, i.e. the transcoder modules fitted, to be accepted as the expected hardware configuration. To access and edit this menu from the **System** menu, press the ► (Forward) key.

/System		HW Config
---------	--	-----------

Press the ▼ (Down) key to view the current hardware configuration.

4.3.6.1**System > HW Config > Accept Option Slot Conf**

This menu enables you to accept the option slot configuration. To access this menu from the **HW Config** menu, press the ► (Forward) key.

To modify the setting, press the **Edit** key. Use the ▲ (Up) and ▼ (Down) keys to toggle between the available options (**true** or **false**). Press the **Save** key to save any changes or press the **Edit** key again to cancel.

/System/ HW Config		Accept Option Slot Conf false
-----------------------	--	----------------------------------

Press the ◀ (Back) key to return to the **HW Config** main menu.

Press the ◀ (Back) key again to return to the **System** menu.



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Web GUI Control

Chapter 5

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5.1 Using the Web Graphical User Interface

The Ericsson SPR1100 is designed to be configured and controlled by its own web graphical user interface (GUI). To use the web GUI, the IP address assigned to the SPR1100 in the front panel system menu should be entered into the address field of the web browser. Provided that the network is correctly configured, the **Status** page should be automatically loaded and displayed.

A number of tabbed pages corresponding to the different functions of the SPR1100 are provided. An example tabbed web page is shown in *Figure 5.1*.

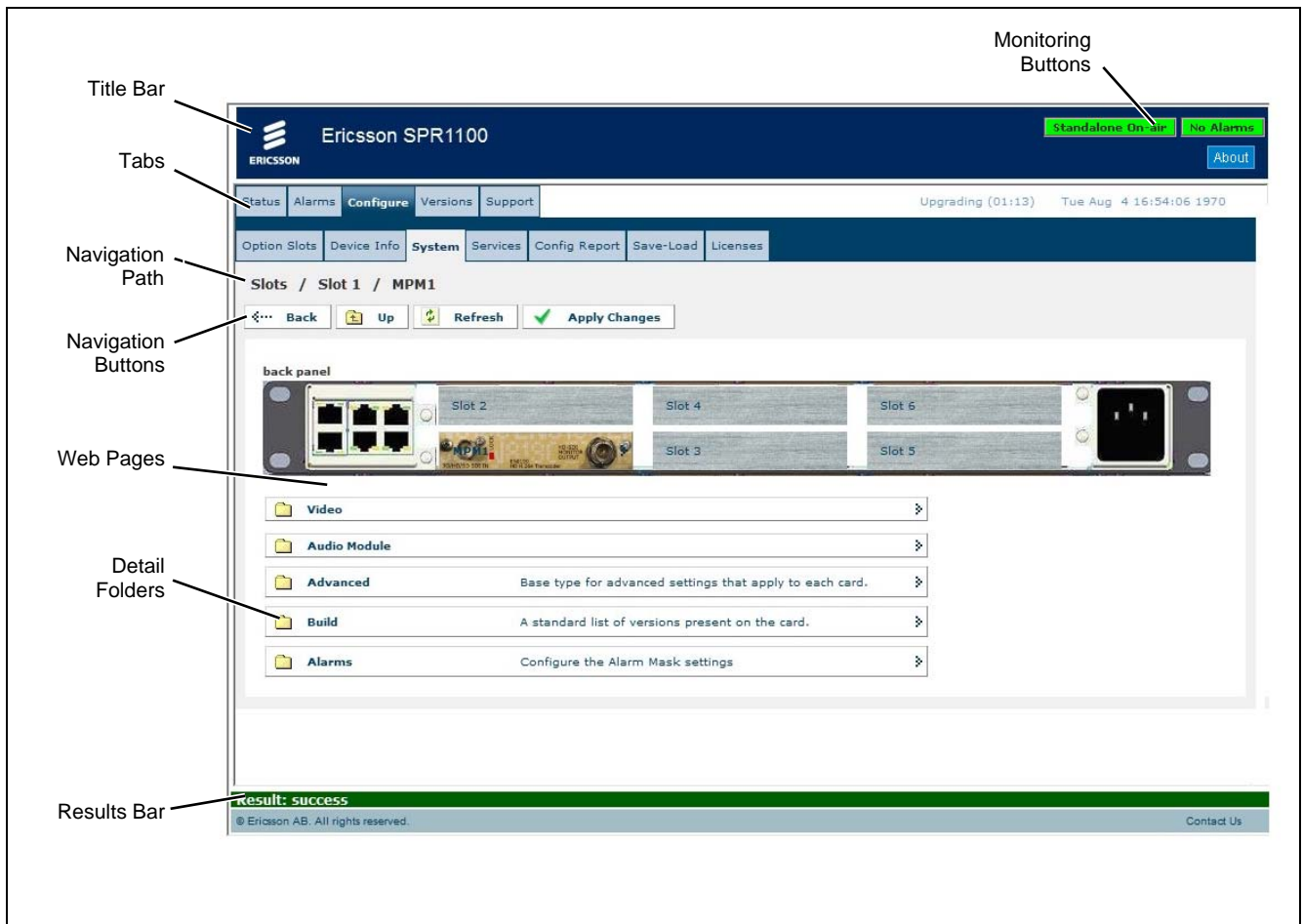


Figure 5.1 Web Page Overview

5.1.1 Title Bar

The header of the web page displays the Ericsson logo and the unit model number.

5.1.2 Standalone On-air / Off-air Button

At the right-hand side of the title bar this colored button indicates the redundancy status of the unit: either **red** (FAIL) or **green** (OK). When clicked, further details are displayed in a pop-up dialog. Click the **OK** button to close the dialog.

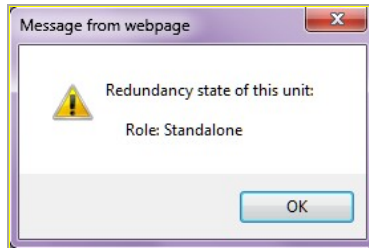


Figure 5.2 Standalone Dialog

5.1.3 Alarms/No Alarms Button

This colored button indicates the current alarm state: **red** (CRITICAL FAILURE), **amber** (ERRORS) or **green** (OK). When clicked, a pop-up dialog shows details of the most recent critical alarm. Click the **OK** button to close the dialog. For detailed break down refer to **Alarm Tab**.

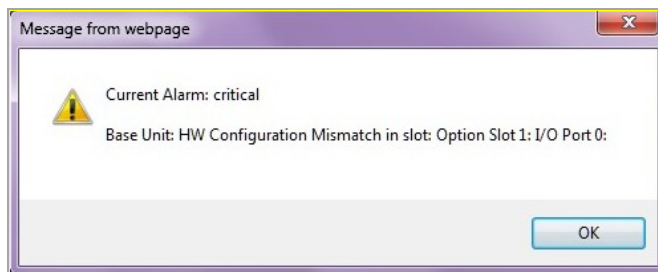


Figure 5.3 Alarm Dialog

5.1.4 About Button

This button, when clicked, displays an information dialog about the unit, including the software version number. Click the **OK** button to close the dialog.

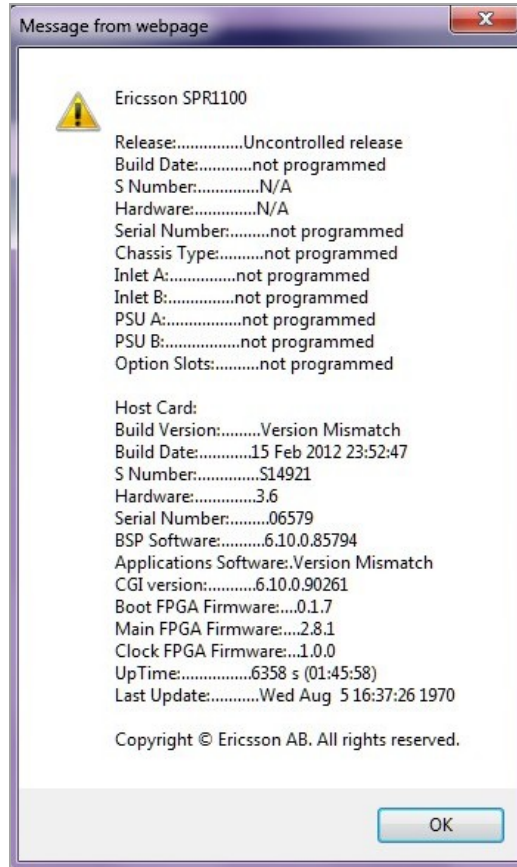


Figure 5.4 About Dialog

5.1.5

Tabs

The web pages for control and monitoring of specific functions are accessed by selecting the appropriate function tab along the top of each web page. When you switch between tabs, the browser remembers the path for each tab. See *Figure 5.9* for an overview of all the available web GUI tab pages.



Figure 5.5 Tabs

5.1.6

Navigation Path

The web pages are organized into a tree-like structure, like the directory on a computer. The current complete navigation path is displayed at the top of the web page, which shows the route taken to the currently displayed web page. To return to a higher level (parent) web page (folder), simply click on the relevant name link in the Navigation Path or click on the tab above.







Figure 5.6 Navigation Path

5.1.7 Navigation Buttons Toolbar

The toolbar provides various tools/buttons, depending on the web page selected. Various icons, buttons and symbols can appear in the toolbar, depending on the web page displayed.

Table 5.1 Web Page Icons, Buttons and Symbols

Item	Description
	Click on this icon to navigate one step up (to the parent folder) in the folder structure.
	Click on this icon to navigate back to the previous view. This icon typically appears when you are editing a single record in a table or a sub-table.
	Click on this button to apply the changes you have made to parameters in this web page. The result of your actions will be shown in the result window below.
	Click on this button to refresh the current screen. This may be useful if the screen contains read-only status parameters such as measured Bit rates.

5.1.8 Web Pages

The content of the tabbed web pages (or folders) displays the unit parameters and their current values. Some parameters will be modifiable by overtyping, by selecting an option from a drop-down menu or by placing a tick in a check-box, as required. Any changes made will not be applied to the unit until the **Apply Changes** button is clicked in the Navigation Buttons Toolbar.

5.1.9 Detail (Sub-Tab Web Page) Buttons

Some tab web GUI pages provide further detailed pages/folders. Single-click anywhere on the bar, folder icon or arrow to open the sub-tab web page. See Figure 5.9 for an overview of all the available web GUI tab pages.



Figure 5.7 Detail Button

5.1.10 Results Frame

The result frame at the bottom of the screen shows the results of command actions. **success**, **success with warnings** or **error** may be displayed, with further details as appropriate for more complex actions.



Figure 5.8 Results Frame

5.1.11 Supported Actions and Features

- **Drag and Drop** – The web GUI supports **drag and drop**, for example in the **Configuration > Services** page, to enables you to quickly copy services and profiles. Additionally, when selecting services and profiles, the web GUI supports **Shift-Click** operation to enables you to select multiple adjacent items, and **Ctrl-Click** operation when selecting multiple non-adjacent items.
- **Drop-Down Menus** – Some web GUI pages provide drop-down menus to enables you to select from the available options.
- **Right-Click/Context Menus** – Some web GUI pages provide right-click menus for speedier configuration.
- **Parameter Highlighting** – When you modify service and profile properties, any changes you make will be highlighted as **orange text**. These changes will not be carried out until they are confirmed, by clicking the **Apply All** green button.
- **Web Page Resizing and Collapsing** – To enable you to view just the information that you need, the panes displayed on some web pages may be resized by dragging the pane boundary, or collapsed by clicking on the ◀ symbol in the pane boundary. If your monitor screen width is less than 1300 pixels, panes may be collapsed automatically.

5.1.12 Navigating the GUI Web Pages

Figure 5.9 shows the main tab pages and detailed (sub-tab) web pages.

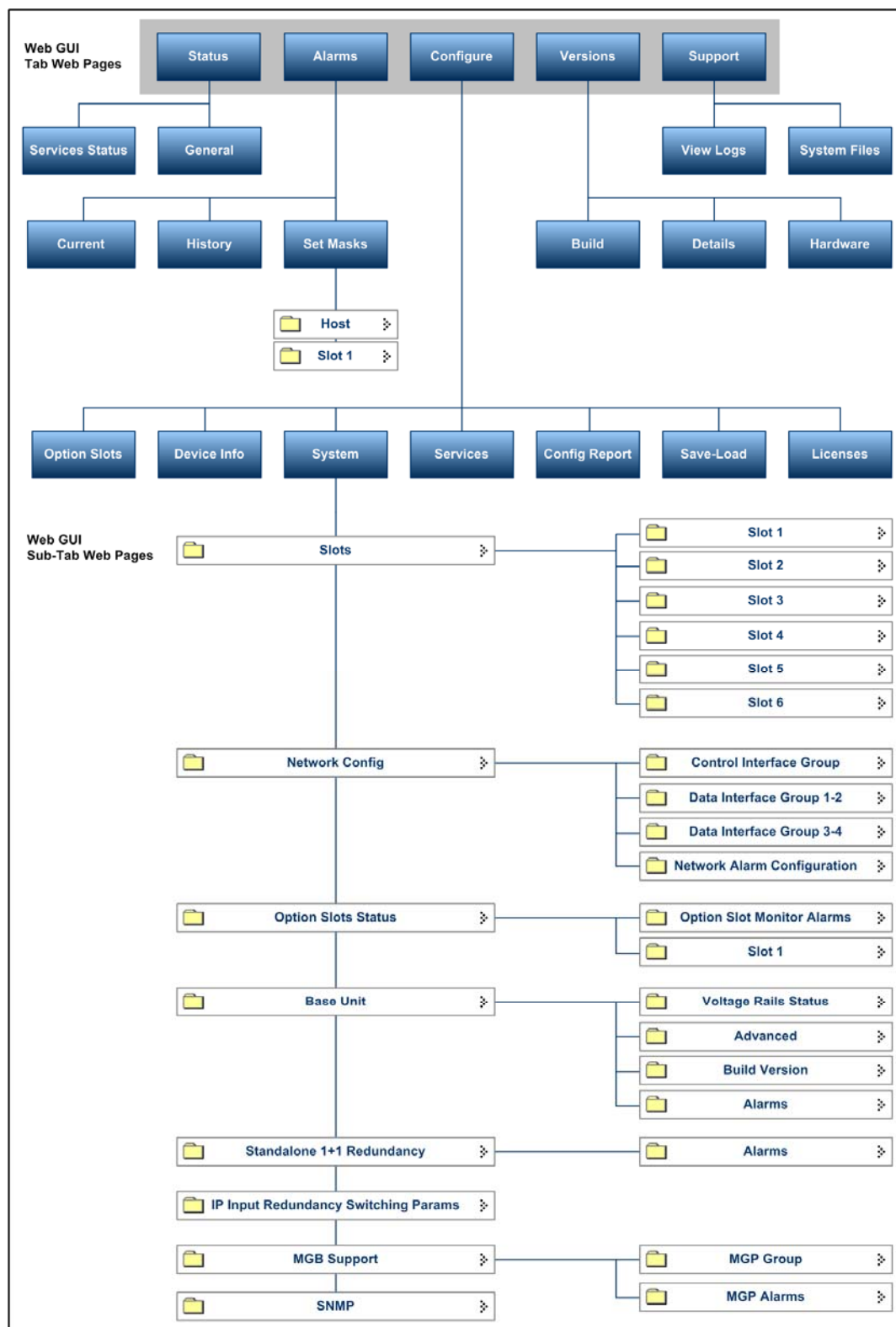


Figure 5.9 Web GUI Navigation

5.2 Status

The operational status of the SPR1100 can be monitored from the **Status** tab web page. Further tabs can be selected from this top-level tab, which show the **Service Status** and **General** status of the unit.

5.2.1 Status > Service Status

To view the service status of the unit select the **Service Status** tab from the **Status** top-level tab.

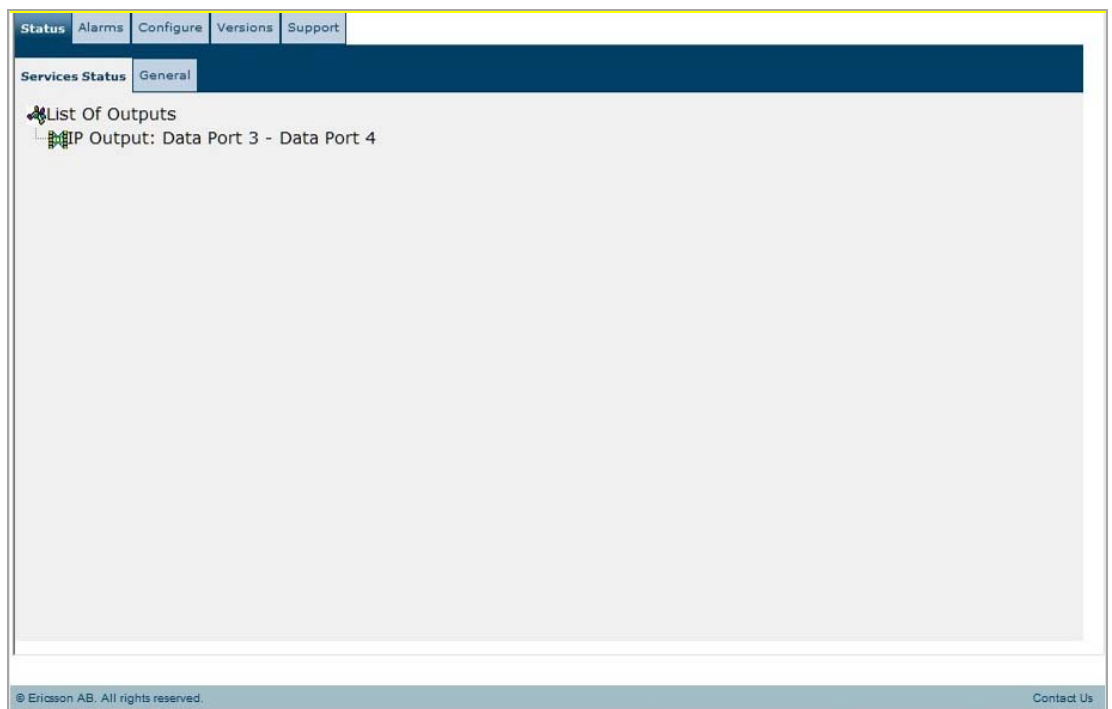


Figure 5.10 Service Status Web Page

This page shows the current list of outputs for the equipment.

5.2.2 Status > General

To view the general status of the unit select the **General** tab from the **Status** top-level tab.

StatusAlarmsConfigureVersionsSupport

Services StatusGeneral

Back

Refresh

Apply Changes

Model

Model: Ericsson SPR1200 Build Version: Uncontrolled release Serial Number: not programmed

Option Slots Summary

	S Number	Description	Serial Number	Hardware
Base Unit	S14921	Host Controller Card	06579	3.6
Slot 1	S14945	MPM1	4079	3.0
Slot 2	empty			
Slot 3	empty			
Slot 4	empty			
Slot 5	empty			
Slot 6	empty			

Control Network Configuration

Output Mode

IP Address

172.17.117.145

Network Mask

255.255.0.0

Gateway

172.17.254.254

Data Ports

Data port IP addresses

Data Port #1

192.168.54.17

Data Port #2

192.168.54.18

Data Port #3

192.168.54.20

Data Port #4

192.168.54.21

Figure 5.11 Status > General Web Page

The following are displayed on this web page:

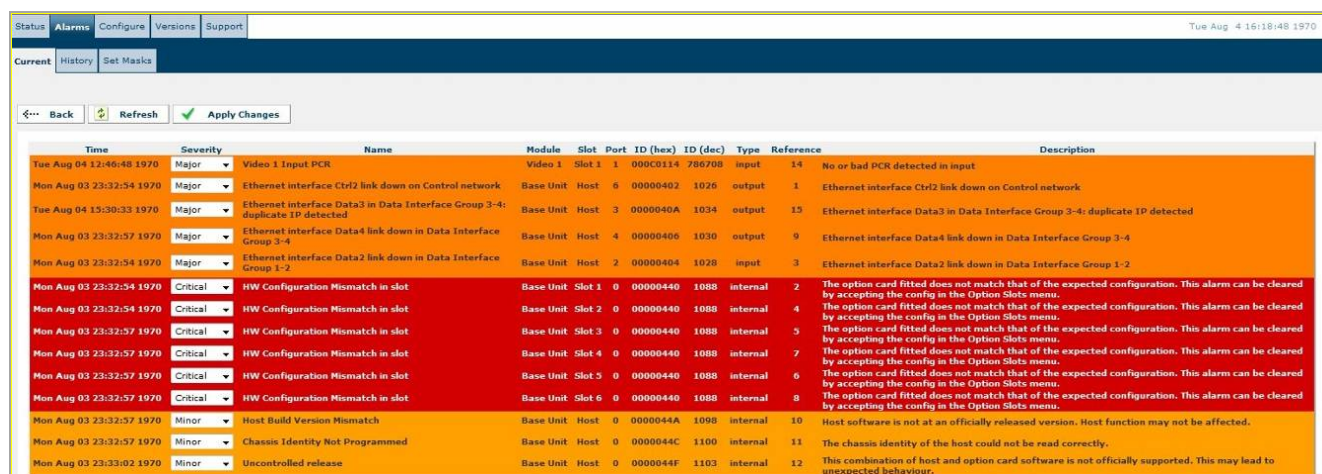
- **IP Address** – The configured IP address for the product.
- **Network Mask** – The network mask address for the product.
- **Gateway** – The gateway address for the product.
- **Data Port IP Addresses #1 - #4** – The configured data port addresses for the product.

5.3 Alarms

The alarms status of the SPR1100 can be monitored from the **Alarms** tab web page. Further tabs can be selected from this top-level tab, which show the **Current** alarms, **History** alarms and a facility which enables you to **Set Masks** or severity levels for individual alarms.

5.3.1 Alarms > Current

To view the current alarm status of the unit select the **Current** tab from the **Alarms** top-level tab.



Time	Severity	Name	Module	Slot	Port	ID (hex)	ID (dec)	Type	Reference	Description
Tue Aug 04 12:46:48 1970	Major	Video 1 Input PCR	Video 1	Slot 1	1	000C0114	786708	input	14	No or bad PCR detected in input
Mon Aug 03 23:32:54 1970	Major	Ethernet interface Ctrf2 link down on Control network	Base Unit	Host	6	00000402	1026	output	1	Ethernet interface Ctrf2 link down on Control network
Tue Aug 04 15:30:33 1970	Major	Ethernet interface Data3 in Data Interface Group 3-4: duplicate IP detected	Base Unit	Host	3	0000040A	1034	output	15	Ethernet interface Data3 in Data Interface Group 3-4: duplicate IP detected
Mon Aug 03 23:32:57 1970	Major	Ethernet interface Data4 link down in Data Interface Group 3-4	Base Unit	Host	4	00000406	1030	output	9	Ethernet interface Data4 link down in Data Interface Group 3-4
Mon Aug 03 23:32:54 1970	Major	Ethernet interface Data2 link down in Data Interface Group 1-2	Base Unit	Host	2	00000404	1028	input	3	Ethernet interface Data2 link down in Data Interface Group 1-2
Mon Aug 03 23:32:54 1970	Critical	HW Configuration Mismatch in slot	Base Unit	Slot 1	0	00000440	1088	internal	2	The option card fitted does not match that of the expected configuration. This alarm can be cleared by accepting the config in the Option Slots menu.
Mon Aug 03 23:32:54 1970	Critical	HW Configuration Mismatch in slot	Base Unit	Slot 2	0	00000440	1088	internal	4	The option card fitted does not match that of the expected configuration. This alarm can be cleared by accepting the config in the Option Slots menu.
Mon Aug 03 23:32:57 1970	Critical	HW Configuration Mismatch in slot	Base Unit	Slot 3	0	00000440	1088	internal	5	The option card fitted does not match that of the expected configuration. This alarm can be cleared by accepting the config in the Option Slots menu.
Mon Aug 03 23:32:57 1970	Critical	HW Configuration Mismatch in slot	Base Unit	Slot 4	0	00000440	1088	internal	7	The option card fitted does not match that of the expected configuration. This alarm can be cleared by accepting the config in the Option Slots menu.
Mon Aug 03 23:32:57 1970	Critical	HW Configuration Mismatch in slot	Base Unit	Slot 5	0	00000440	1088	internal	6	The option card fitted does not match that of the expected configuration. This alarm can be cleared by accepting the config in the Option Slots menu.
Mon Aug 03 23:32:57 1970	Critical	HW Configuration Mismatch in slot	Base Unit	Slot 6	0	00000440	1088	internal	8	The option card fitted does not match that of the expected configuration. This alarm can be cleared by accepting the config in the Option Slots menu.
Mon Aug 03 23:32:57 1970	Minor	Host Build Version Mismatch	Base Unit	Host	0	0000044A	1098	internal	10	Host software is not at an officially released version. Host function may not be affected.
Mon Aug 03 23:32:57 1970	Minor	Chassis Identity Not Programmed	Base Unit	Host	0	0000044C	1100	internal	11	The chassis identity of the host could not be read correctly.
Mon Aug 03 23:33:02 1970	Minor	Uncontrolled release	Base Unit	Host	0	0000044F	1103	internal	12	This combination of host and option card software is not officially supported. This may lead to unexpected behaviour.

Figure 5.12 Alarms > Current Web Page

This page displays a list of alarms which are currently active on the unit and all the details of that alarm. The following color code is used:

- **Red** – Critical alarms.
- **Orange** – Major alarms.
- **Yellow** – Minor alarms.

The column showing the **Severity** of the alarm comprises a drop down menu which enables you to change the setting.

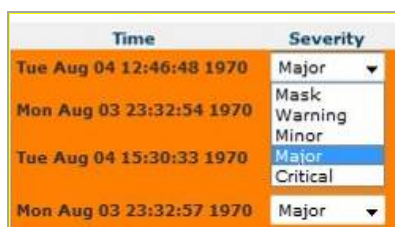


Figure 5.13 Alarm Severity Drop-down Menu

This menu may be used to change the default setting of alarms which do not affect the operation being performed. Only Critical alarms cause a redundancy switch.

5.3.2 Alarms > History

To view the alarm history of the unit select the **History** tab from the **Alarms** top-level tab.

StatusAlarmsConfigureVersionsSupport

CurrentHistorySet Masks

Alarm History

⏮ Back

🔄 Refresh

Time	Severity	Name	Module	Slot	Port	ID (hex)	ID (dec)	Type	Reference
Tue Aug 04 15:30:33 1970	major	Ethernet interface Data3 in Data Interface Group 3-4: duplicate IP detected	Base Unit	Host	3	0000040a	1034	output	21
Tue Aug 04 12:46:48 1970	major	Video 1 Input PCR	Video 1	Slot 1	1	000c0114	786708	input	20
Mon Aug 03 23:34:18 1970	major	Video 1 Input Lock	Video 1	Slot 1	1	000c0111	786705	input	19
Mon Aug 03 23:34:18 1970	major	Video 1 Input Lock	Video 1	Slot 1	1	000c0111	786705	input	19
Mon Aug 03 23:33:02 1970	minor	Uncontrolled release	Base Unit	Host	0	0000044f	1103	internal	18
Mon Aug 03 23:32:57 1970	minor	Chassis Identity Not Programmed	Base Unit	Host	0	0000044c	1100	internal	17
Mon Aug 03 23:32:57 1970	minor	Host Build Version Mismatch	Base Unit	Host	0	0000044a	1098	internal	16
Mon Aug 03 23:32:57 1970	critical	HW Configuration Mismatch in slot	Base Unit	Slot 6	0	00000440	1088	internal	8
Mon Aug 03 23:32:57 1970	critical	HW Configuration Mismatch in slot	Base Unit	Slot 5	0	00000440	1088	internal	6
Mon Aug 03 23:32:57 1970	critical	HW Configuration Mismatch in slot	Base Unit	Slot 4	0	00000440	1088	internal	7
Mon Aug 03 23:32:57 1970	critical	HW Configuration Mismatch in slot	Base Unit	Slot 3	0	00000440	1088	internal	5
Mon Aug 03 23:32:54 1970	critical	HW Configuration Mismatch in slot	Base Unit	Slot 2	0	00000440	1088	internal	4
Mon Aug 03 23:32:54 1970	critical	HW Configuration Mismatch in slot	Base Unit	Slot 1	0	00000440	1088	internal	2
Mon Aug 03 23:32:54 1970	major	Ethernet interface Data2 link down in Data Interface Group 1-2	Base Unit	Host	2	00000404	1028	input	3
Mon Aug 03 23:32:57 1970	major	Ethernet interface Data4 link down in Data Interface Group 3-4	Base Unit	Host	4	00000406	1030	output	9
Mon Aug 03 23:32:54 1970	major	Ethernet interface Ctrl2 link down on Control network	Base Unit	Host	6	00000402	1026	output	1

Figure 5.14 Alarms > History Web Page

This page shows the history of alarms on the unit. There are no editable fields on this page.

5.3.3 Alarms > Set Mask

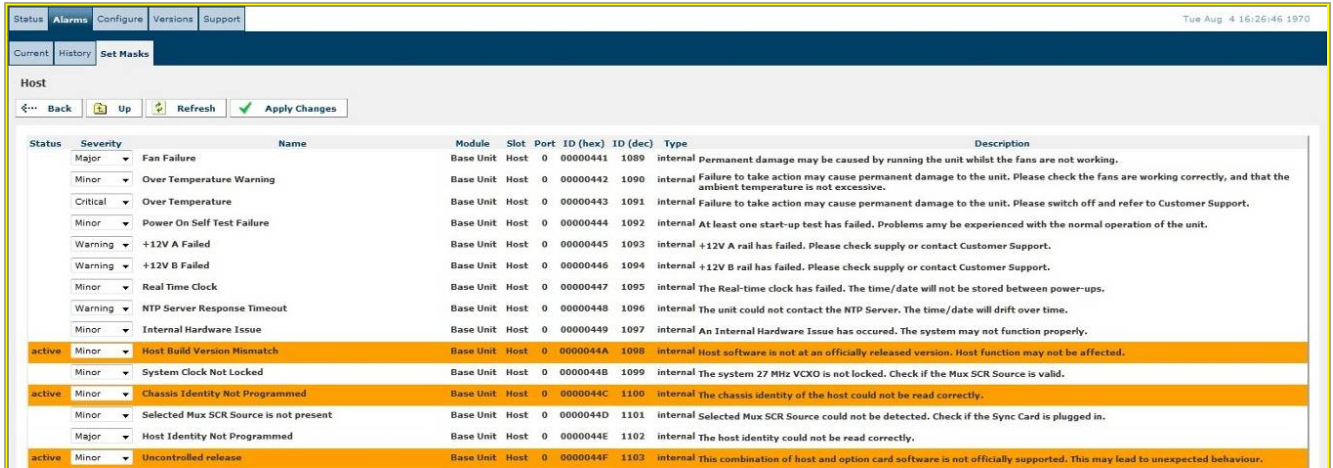
To view and set alarm masks of the unit select the **Set Masks** tab from the **Alarms** top-level tab.

Status	Alarms	Configure	Versions	Support
Current	History	Set Masks		
<div> <div>Back</div> <div>Refresh</div> </div>				
<div> <div>Host</div> <div>Host Controller</div> </div>				
<div> <div>Slot 1</div> <div>MPM1</div> </div>				

Figure 5.15 Alarms > Set Masks Web Page

5.3.3.1 Alarms > Set Masks > Host

To set alarm masks on the Host controller, select the **Host** button from the **Set Masks** page.



The screenshot shows the 'Set Masks' page for the 'Host' controller. The page has a navigation bar with 'Status', 'Alarms', 'Configure', 'Versions', and 'Support'. Below the navigation bar, there are tabs for 'Current', 'History', and 'Set Masks'. The 'Set Masks' tab is active. The page title is 'Host'. Below the title, there are buttons for 'Back', 'Up', 'Refresh', and 'Apply Changes'. The main content area is a table with columns: Status, Severity, Name, Module, Slot, Port, ID (hex), ID (dec), Type, and Description. The table lists various alarms for the Host controller, including Fan Failure, Over Temperature Warning, Power On Self Test Failure, +12V A Failed, +12V B Failed, Real Time Clock, NTP Server Response Timeout, Internal Hardware Issue, Host Build Version Mismatch, System Clock Not Locked, Chassis Identity Not Programmed, Selected Mux SCR Source is not present, Host Identity Not Programmed, and Uncontrolled release. Each row has a dropdown menu for selecting the severity level of the alarm.

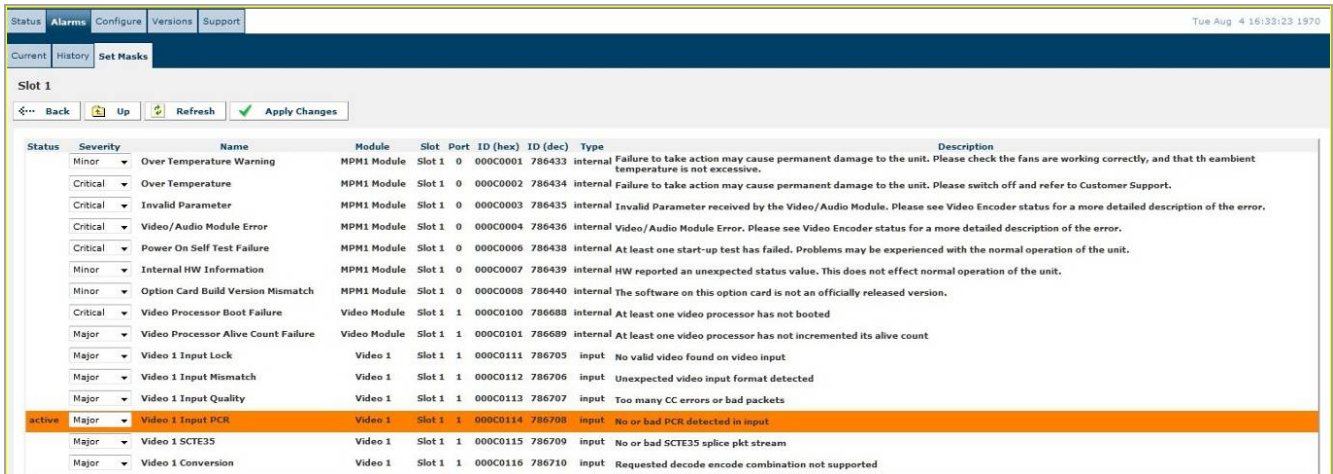
Status	Severity	Name	Module	Slot	Port	ID (hex)	ID (dec)	Type	Description
	Major	Fan Failure	Base Unit	Host	0	00000441	1089	internal	Permanent damage may be caused by running the unit whilst the fans are not working.
	Minor	Over Temperature Warning	Base Unit	Host	0	00000442	1090	internal	Failure to take action may cause permanent damage to the unit. Please check the fans are working correctly, and that the ambient temperature is not excessive.
	Critical	Over Temperature	Base Unit	Host	0	00000443	1091	internal	Failure to take action may cause permanent damage to the unit. Please switch off and refer to Customer Support.
	Minor	Power On Self Test Failure	Base Unit	Host	0	00000444	1092	internal	At least one start-up test has failed. Problems may be experienced with the normal operation of the unit.
	Warning	+12V A Failed	Base Unit	Host	0	00000445	1093	internal	+12V A rail has failed. Please check supply or contact Customer Support.
	Warning	+12V B Failed	Base Unit	Host	0	00000446	1094	internal	+12V B rail has failed. Please check supply or contact Customer Support.
	Minor	Real Time Clock	Base Unit	Host	0	00000447	1095	internal	The Real-time clock has failed. The time/date will not be stored between power-ups.
	Warning	NTP Server Response Timeout	Base Unit	Host	0	00000448	1096	internal	The unit could not contact the NTP Server. The time/date will drift over time.
	Minor	Internal Hardware Issue	Base Unit	Host	0	00000449	1097	internal	An Internal Hardware Issue has occurred. The system may not function properly.
active	Minor	Host Build Version Mismatch	Base Unit	Host	0	0000044A	1098	internal	Host software is not at an officially released version. Host function may not be affected.
	Minor	System Clock Not Locked	Base Unit	Host	0	0000044B	1099	internal	The system 27 Mhz VCXO is not locked. Check if the Mux SCR Source is valid.
active	Minor	Chassis Identity Not Programmed	Base Unit	Host	0	0000044C	1100	internal	The chassis identity of the host could not be read correctly.
	Minor	Selected Mux SCR Source is not present	Base Unit	Host	0	0000044D	1101	internal	Selected Mux SCR Source could not be detected. Check if the Sync Card is plugged in.
	Major	Host Identity Not Programmed	Base Unit	Host	0	0000044E	1102	internal	The host identity could not be read correctly.
active	Minor	Uncontrolled release	Base Unit	Host	0	0000044F	1103	internal	This combination of host and option card software is not officially supported. This may lead to unexpected behaviour.

Figure 5.16 Set Masks > Host Web Page

This page gives a detailed list of all the alarms that may occur on the Host controller and provides a drop-down menu for each alarm to allow the user to select the severity level of that alarm. This menu is identical to that shown in *Figure 5.13*.

5.3.3.2 Alarms > Set Masks > Slot 1 (MPM 1)

To set alarm masks on the Media Processing Module located in Slot 1, select the **Slot 1** button from the **Set Masks** page.



The screenshot shows the 'Set Masks' page for 'Slot 1' (MPM 1). The page has a navigation bar with 'Status', 'Alarms', 'Configure', 'Versions', and 'Support'. Below the navigation bar, there are tabs for 'Current', 'History', and 'Set Masks'. The 'Set Masks' tab is active. The page title is 'Slot 1'. Below the title, there are buttons for 'Back', 'Up', 'Refresh', and 'Apply Changes'. The main content area is a table with columns: Status, Severity, Name, Module, Slot, Port, ID (hex), ID (dec), Type, and Description. The table lists various alarms for the Media Processing Module located in Slot 1, including Over Temperature Warning, Invalid Parameter, Video/Audio Module Error, Power On Self Test Failure, Internal HW Information, Option Card Build Version Mismatch, Video Processor Boot Failure, Video Processor Alive Count Failure, Video 1 Input Lock, Video 1 Input Mismatch, Video 1 Input Quality, Video 1 Input PCR, Video 1 SCTE35, and Video 1 Conversion. Each row has a dropdown menu for selecting the severity level of the alarm.

Status	Severity	Name	Module	Slot	Port	ID (hex)	ID (dec)	Type	Description
	Minor	Over Temperature Warning	MPM1 Module	Slot 1	0	000C0001	786433	internal	Failure to take action may cause permanent damage to the unit. Please check the fans are working correctly, and that the ambient temperature is not excessive.
	Critical	Over Temperature	MPM1 Module	Slot 1	0	000C0002	786434	internal	Failure to take action may cause permanent damage to the unit. Please switch off and refer to Customer Support.
	Critical	Invalid Parameter	MPM1 Module	Slot 1	0	000C0003	786435	internal	Invalid Parameter received by the Video/Audio Module. Please see Video Encoder status for a more detailed description of the error.
	Critical	Video/Audio Module Error	MPM1 Module	Slot 1	0	000C0004	786436	internal	Video/Audio Module Error. Please see Video Encoder status for a more detailed description of the error.
	Critical	Power On Self Test Failure	MPM1 Module	Slot 1	0	000C0005	786438	internal	At least one start-up test has failed. Problems may be experienced with the normal operation of the unit.
	Minor	Internal HW Information	MPM1 Module	Slot 1	0	000C0007	786439	internal	HW reported an unexpected status value. This does not effect normal operation of the unit.
	Minor	Option Card Build Version Mismatch	MPM1 Module	Slot 1	0	000C0008	786440	internal	The software on this option card is not an officially released version.
	Critical	Video Processor Boot Failure	Video Module	Slot 1	1	000C0100	786608	internal	At least one video processor has not booted
	Major	Video Processor Alive Count Failure	Video Module	Slot 1	1	000C0101	786609	internal	At least one video processor has not incremented its alive count
	Major	Video 1 Input Lock	Video 1	Slot 1	1	000C0111	786705	input	No valid video found on video input
	Major	Video 1 Input Mismatch	Video 1	Slot 1	1	000C0112	786706	input	Unexpected video input format detected
	Major	Video 1 Input Quality	Video 1	Slot 1	1	000C0113	786707	input	Too many CC errors or bad packets
active	Major	Video 1 Input PCR	Video 1	Slot 1	1	000C0114	786708	input	No or bad PCR detected in input
	Major	Video 1 SCTE35	Video 1	Slot 1	1	000C0115	786709	input	No or bad SCTE35 splice pkt stream
	Major	Video 1 Conversion	Video 1	Slot 1	1	000C0116	786710	input	Requested decode encode combination not supported

Figure 5.17 Set Masks > Slot 1 Web Page

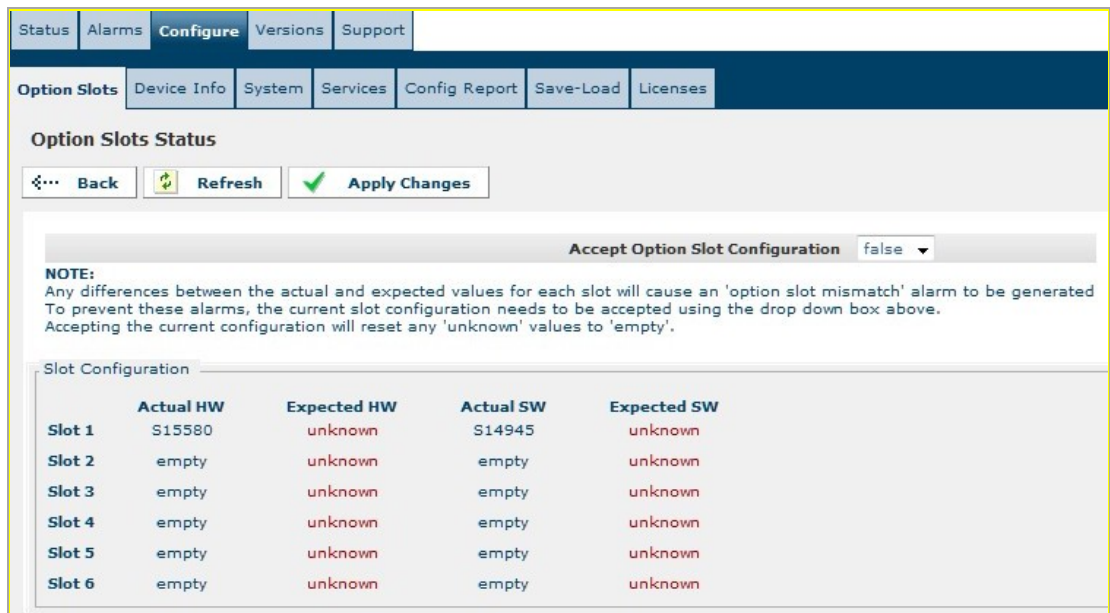
This page gives a detailed list of all the alarms that may occur on the MPM located in Slot 1, and provides a drop-down menu for each alarm to allow the user to select the severity level of that alarm. This menu is identical to that shown in *Figure 5.13*.

5.4 Configure

The **Configure** tab enables the user to view and/or configure all parameters of the Stream Processor. Further tabs can be selected from this top-level tab, for **Option Slots**, **Device Info**, **System**, **Services**, **Config Report**, **Save-Load** and **Licenses**.

5.4.1 Configure > Option Slots Status

To view and accept the current option slot status, select the top-level **Configure** tab followed by the **Option Slots** tab.



Slot	Actual HW	Expected HW	Actual SW	Expected SW
Slot 1	S15580	unknown	S14945	unknown
Slot 2	empty	unknown	empty	unknown
Slot 3	empty	unknown	empty	unknown
Slot 4	empty	unknown	empty	unknown
Slot 5	empty	unknown	empty	unknown
Slot 6	empty	unknown	empty	unknown

Figure 5.18 Configure > Option Slots Web Page

This page gives details of the actual values and expected values for each of the option slots. Any differences will generate an **Option Slot Mismatch** alarm. This alarm is raised when an MPM is inserted or removed. To clear these alarms, select the **true** option from the **Accept Option Slot Configuration** drop-down menu.

5.4.2 Configure > Device Info

This page displays various details about the units such as time and date, network configuration and HTTP Authentication. To view and edit these details, select the **Device Info** tab from the top-level **Configure** tab.

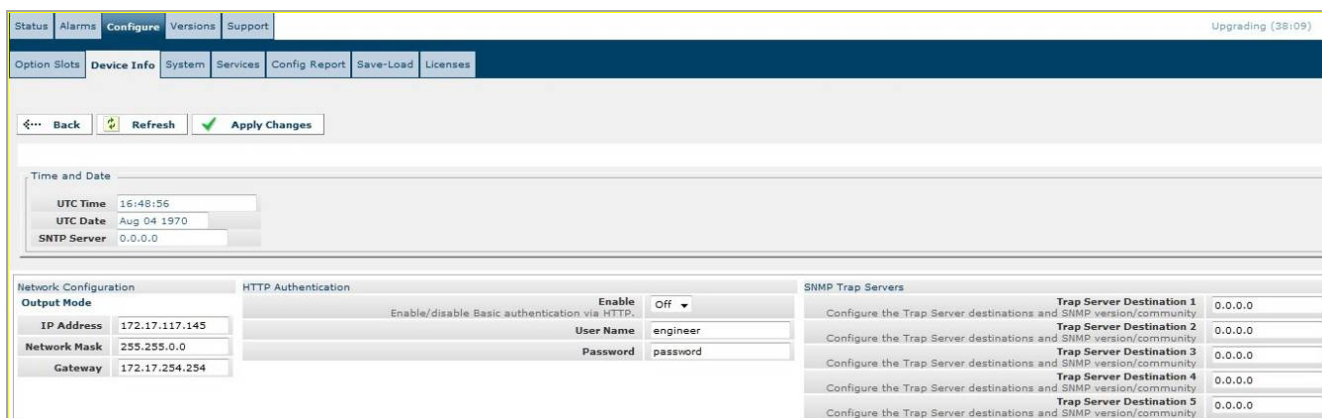


Figure 5.19 Configure > Device Info Web Page

The following fields, which may be edited by the user, are displayed on this page:

Time and Date Pane

- **UTC Time** – Universal Time Code Time
- **UTC Date** – Universal Time Code Date
- **SNTP Server** – The address of the SNTP Server.

Network Configuration/Output Mode Pane

- **IP Address** – The current IP Address.
- **Network Mask** – The current Network Mask Address.
- **Gateway** – The current Gateway Address.

HTTP Authentication Pane

- **Enable** - Enable/Disable Basic Authentication via HTTP.
- **User Name** – Current user name.
- **Password** – Current user password.

SNMP Trap Server Pane

- **Trap Server Destination 1-5** – Enables you to configure the Trap Server destinations and SNMP version/community.

5.4.3 Configure > System

This web page enables you to configure system-wide parameters of the unit. To view this page, select the **System** tab from the top-level **Configure** tab.

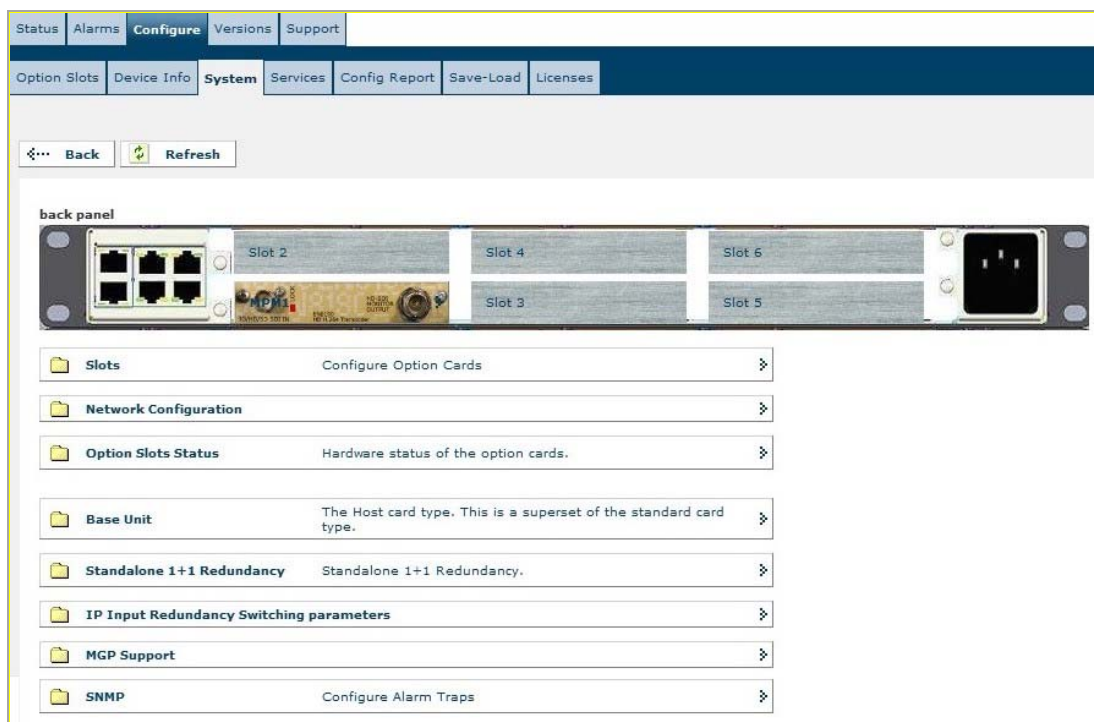


Figure 5.20 Configure > System Web Page

5.4.3.1 Configure > System > Slots

To view and configure the modules fitted in the unit, select the **Slots** button from this web page. This web page is only used to configure some aspects of the unit: e.g. Alarm Masks & Dolby Metadata Presets. Most configuration is done on the **Configure > Services** tab.

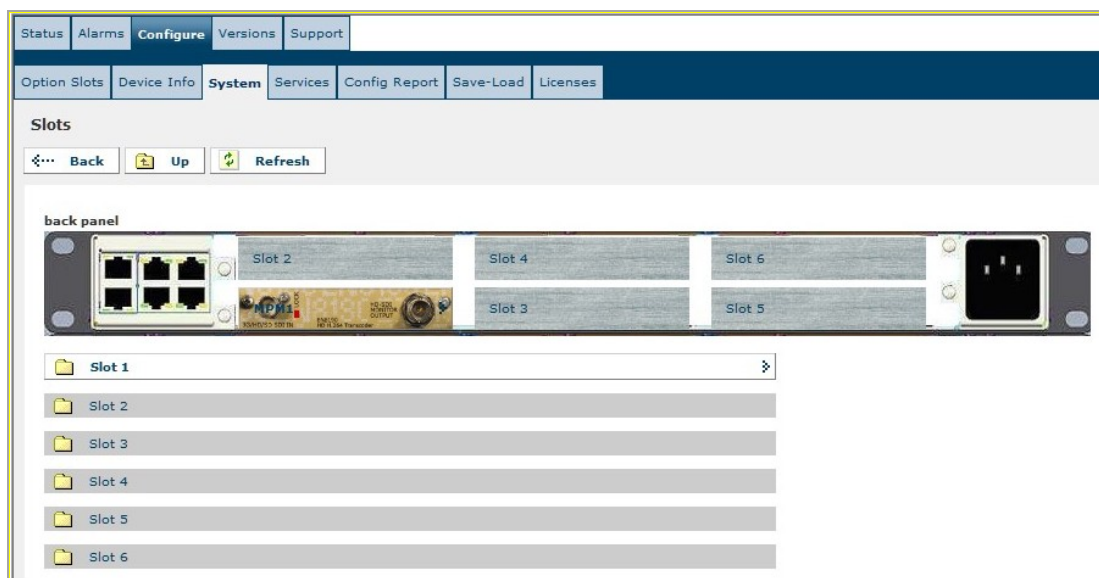


Figure 5.21 System > Slots Web Page

The **Slot 1** button enables you to configure the module fitted in Slot 1 of the unit.

5.4.3.1.1 Configure > System > Slots > Slot 1 > MPM1

To view and edit the parameters of the module located in slot 1, select the **Slot 1** button from the **System > Slots** web page.

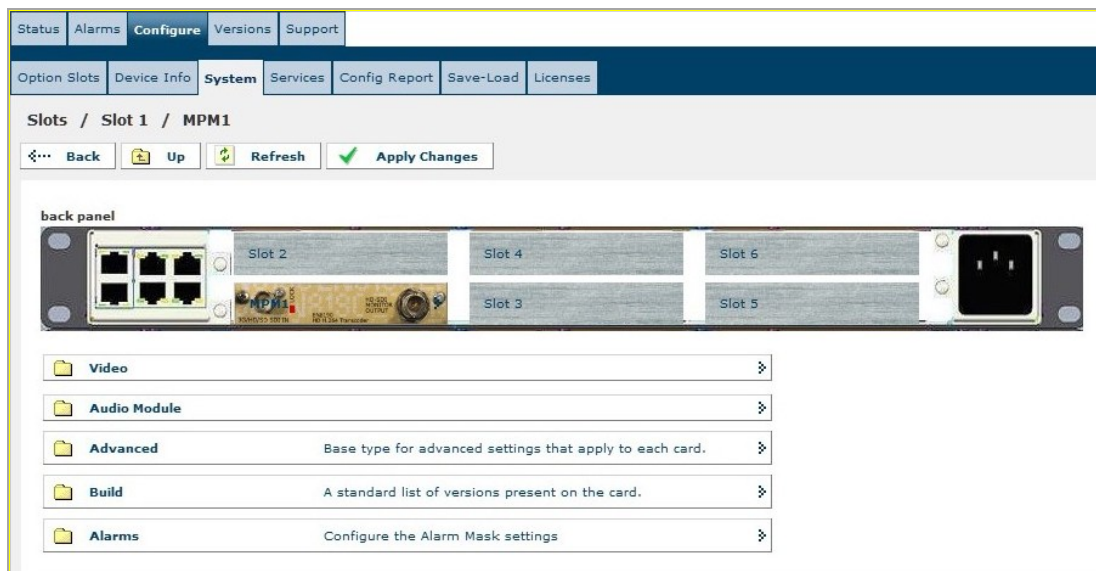


Figure 5.22 Slot 1 > MPM1 Web Page

This page gives access to a range of parameters and information associated with the Media Processing Module.

Configure > System > Slots > Slot 1 > MPM1 > Video

Select the **Video** button from the **Slot > MPM1** web page.

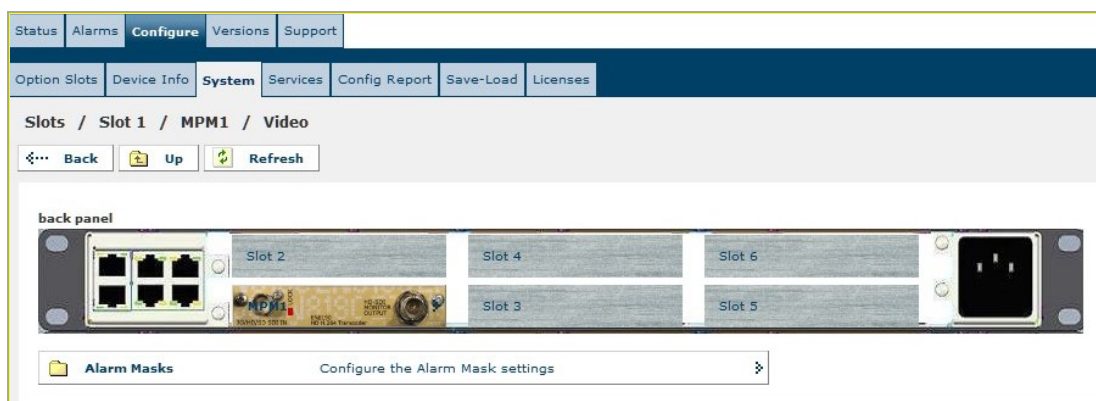


Figure 5.23 MPM1 > Video Web Page

This page gives the user the capability to configure the Alarm Mask settings for the Video processor.

Configure > System > Slots > Slot 1 > MPM1 > Video > Alarm masks

To view and edit current settings, select the **Alarm Masks** button from **MPM1 > Video** web page.

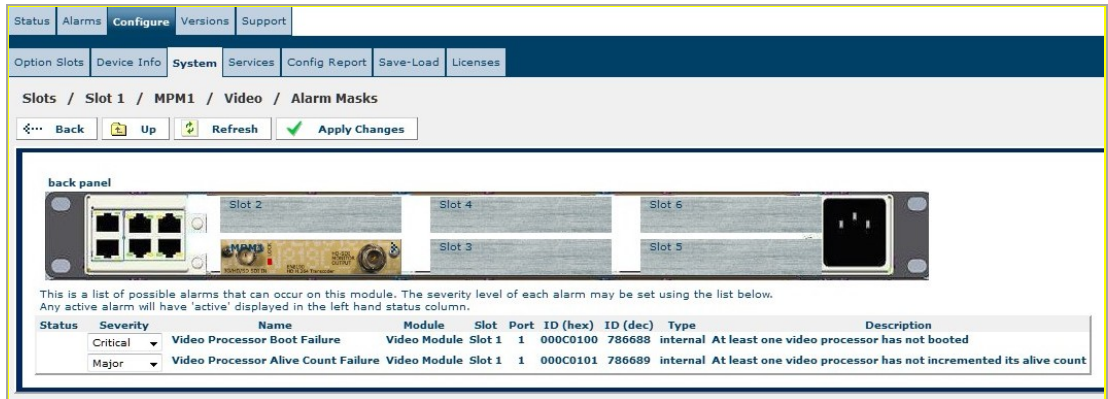


Figure 5.24 Video > Alarm Masks Web Page

This page gives a detailed list of all the alarms that may occur on the MPM video processor and provides a drop-down menu for each alarm to allow the user to select the severity level of that alarm. This menu is identical to that shown in Figure 5.13.

Configure > System > Slots > Slot 1 > MPM1 > Audio Module

Select the **Audio Module** button from the **Slot > MPM1** web page.

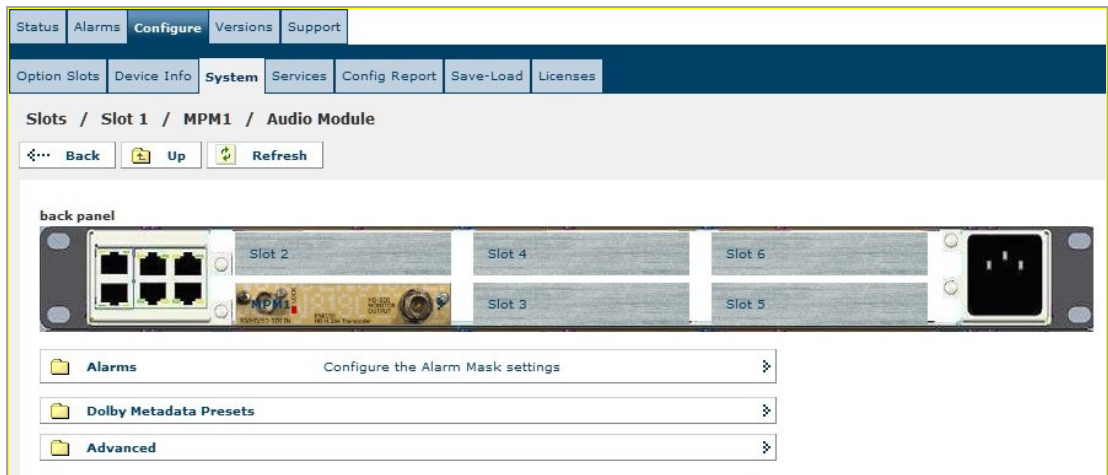


Figure 5.25 MPM1 > Audio Module Page

This page gives the user the capability to configure the Alarm Masks and some other settings for the Audio Module.

Configure > System > Slots > Slot 1 > MPM1 > Audio Module > Alarms

To view and edit current settings, select the **Alarms** button from **MPM1 > Audio Module** web page.



Figure 5.26 Audio Module > Alarms Web Page

This page gives a detailed list of all the alarms that may occur on the MPM Audio Module and provides a drop-down menu for each alarm to allow the user to select the severity level of that alarm. This menu is identical to that shown in *Figure 5.13*.

Configure > System > Slots > Slot 1 > MPM1 > Audio Module > Dolby Metadata Presets

To view and edit current settings, select the **Dolby Metadata Presets** button from the **MPM1 > Audio Module** web page.

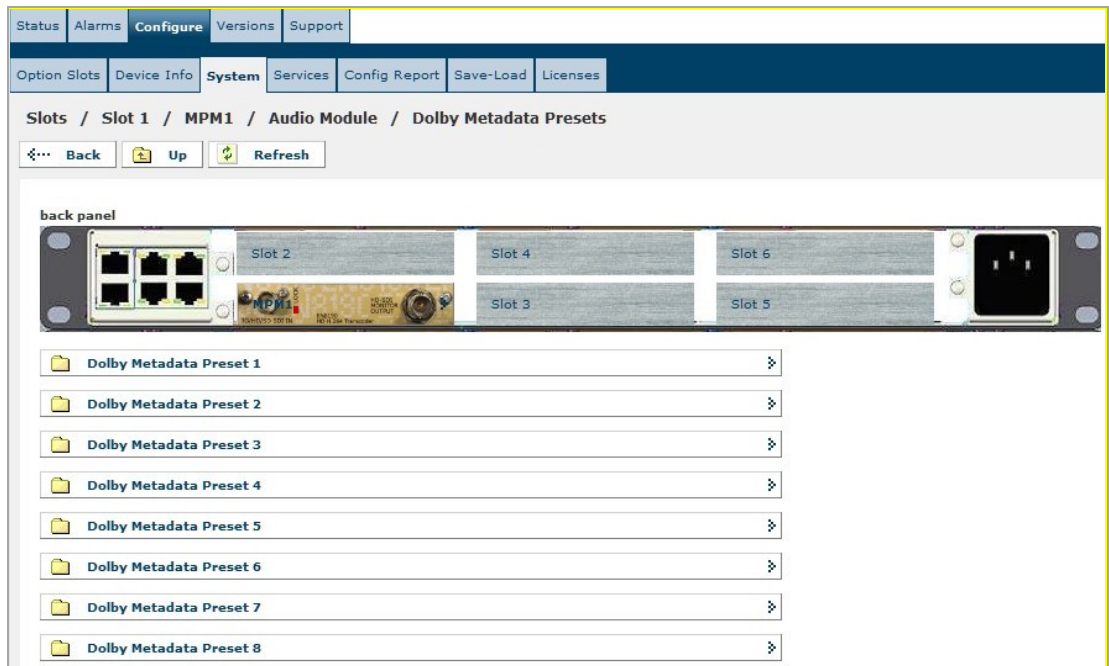
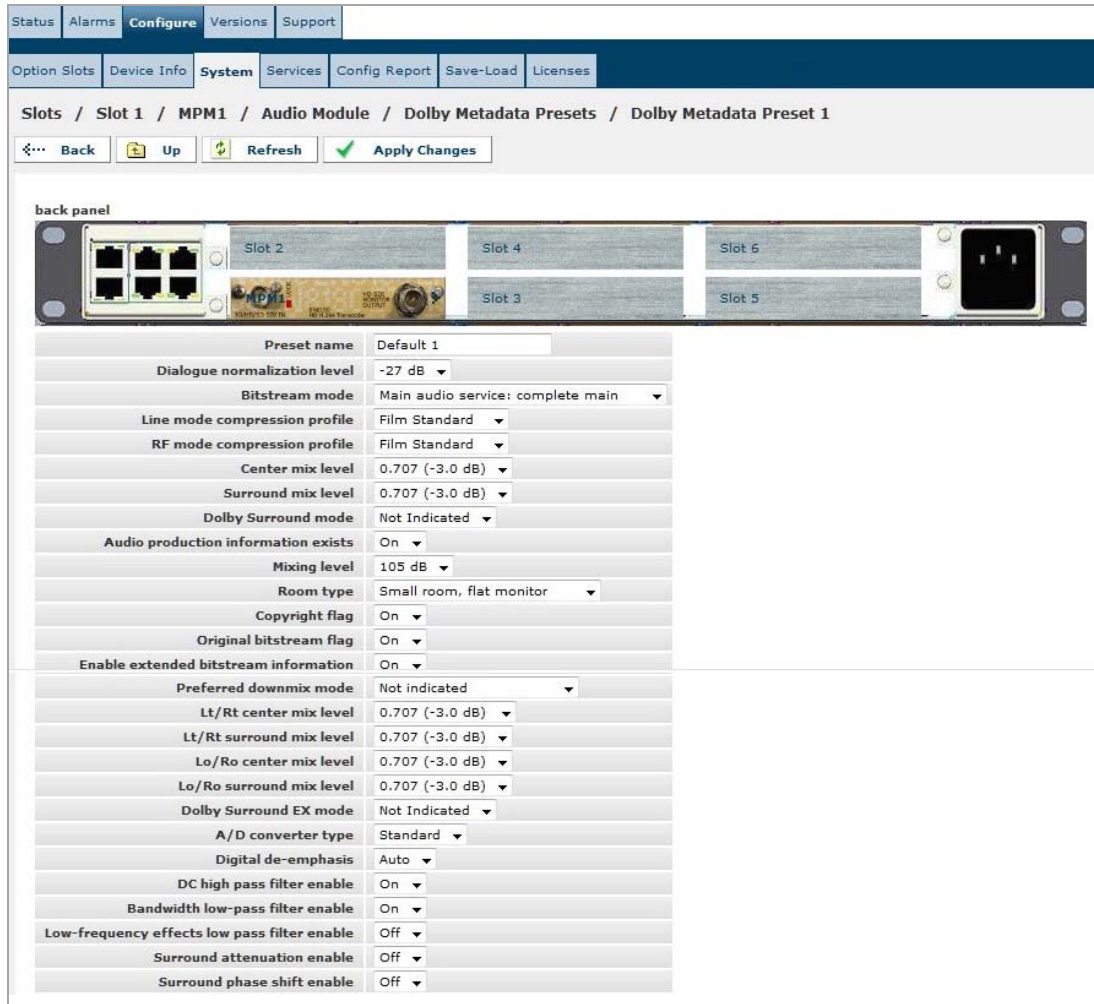


Figure 5.27 Audio Module > Dolby Metadata Presets Web Page

This page shows the Dolby Metadata Presets which are available and which can be viewed and edited by the user.

Configure > System > Slots > Slot 1 > MPM1 > Audio Module > Dolby Metadata Presets > Dolby Metadata Presets 1

To view and edit current settings, select the **Dolby Metadata Presets1** button from the **Audio Module > Dolby Metadata Presets1** web page.



Preset name	Default 1
Dialogue normalization level	-27 dB
Bitstream mode	Main audio service: complete main
Line mode compression profile	Film Standard
RF mode compression profile	Film Standard
Center mix level	0.707 (-3.0 dB)
Surround mix level	0.707 (-3.0 dB)
Dolby Surround mode	Not Indicated
Audio production information exists	On
Mixing level	105 dB
Room type	Small room, flat monitor
Copyright flag	On
Original bitstream flag	On
Enable extended bitstream information	On
Preferred downmix mode	Not indicated
Lt/Rt center mix level	0.707 (-3.0 dB)
Lt/Rt surround mix level	0.707 (-3.0 dB)
Lo/Ro center mix level	0.707 (-3.0 dB)
Lo/Ro surround mix level	0.707 (-3.0 dB)
Dolby Surround EX mode	Not Indicated
A/D converter type	Standard
Digital de-emphasis	Auto
DC high pass filter enable	On
Bandwidth low-pass filter enable	On
Low-frequency effects low pass filter enable	Off
Surround attenuation enable	Off
Surround phase shift enable	Off

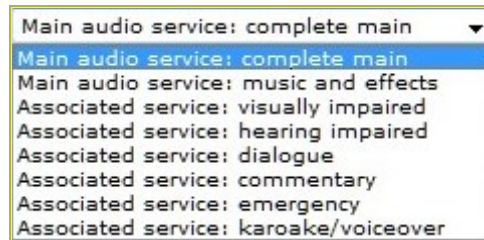
Figure 5.28 Dolby Metadata Presets > Dolby Metadata Presets 1 Web Page

If Dolby encoding is selected, metadata will be embedded in the encoded audio stream to correspond to the following settings. The purpose and use of this metadata is defined by Dolby and allows the decoder to make intelligent choices when decoding the audio. For further information, refer to Dolby documentation. Several preset groups can be setup to allow, if required, each encoded audio stream to have different metadata.

See *Annex D, Dolby Metadata Presets* for further details of these parameters.

- **Preset Name** – The current name of the selected preset.
- **Dialogue Normalization Level** – A drop down menu giving a choice of values from 1 – 31 dB

- **Bitstream Mode** – A drop-down menu enabling the selection of the bitstream mode.



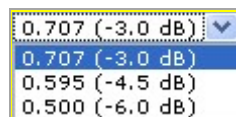
- **Line Mode Compression Profile** – A drop-down menu enabling the selection of the line mode compression profile.



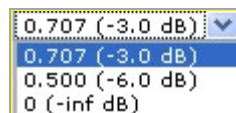
- **RF Mode Compression Profile** – A drop-down menu enabling the selection of the RF mode compression profile.



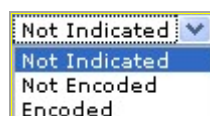
- **Center Mix Level** – A drop-down menu enabling the center mix level to be specified.



- **Surround Mix Level** – A drop-down menu enabling the surround mix level to be specified.

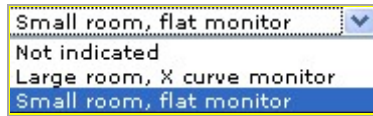


- **Dolby Surround Mode** – A drop-down menu enabling the Dolby surround mode to be specified.

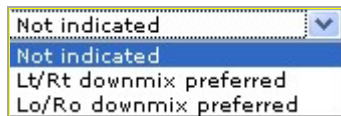


- **Audio Production Information Exists** – A drop-down menu specifying whether audio production information exists. Can be set to On/Off.

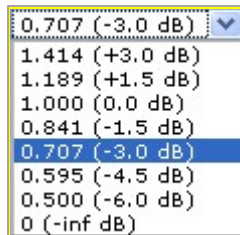
- **Mixing Level** – A drop-down menu specifying the mixing level.
- **Room type** – Enables you to select the room and monitor type.



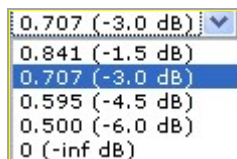
- **Copyright Flag** – A drop-down menu enabling the copyright flag to be turned On/Off.
- **Original Bitstream Flag** – A drop-down menu enabling the original bitstream flag to be set to On/Off.
- **Enable Extended Bitstream Information** – A drop-down menu enabling the extended bitstream information to be turned On/Off.
- **Preferred Downmix Mode** – A drop-down menu specifying the preferred downmix mode used.



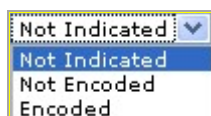
- **Lt/Rt Center Mix Level** – A drop-down menu specifying the left/right center mix.



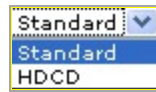
- **Lt/Rt Surround Mix Level** – A drop-down menu specifying the left/right surround mix. Menu as above.
- **Lo/Ro Center Mix Level** – A drop-down menu specifying the lo/ro center mix level.



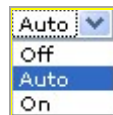
- **Lo/Ro Surround Mix Level** – A drop-down menu specifying the lo/ro surround mix level. Menu as above.
- **Dolby Surround Ex Mode** – A drop-down menu specifying the Dolby Surround encoding mode.



- **A/D Converter Type** – A drop-down menu specifying the analog-to-digital conversion method used.



- **Digital Re-emphasis** – A drop-down menu specifying the method of digital re-emphasis used, if any.



- **DC High-Pass Filter Enable** – A drop-down menu enabling the DC high-pass filter to be set to On/Off.
- **Bandwidth Low-Pass Filter Enable** – A drop-down menu enabling the bandwidth low-pass filter to be set to On/Off.
- **Low Frequency Effects Low-Pass Filter Enable** – A drop-down menu enabling the low frequency effects low-pass filter to be set to On/Off.
- **Surround Attenuation Enable** – A drop-down menu enabling surround attenuation enable to be set to On/Off.
- **Surround Phase Shift Enable** – A drop-down menu enabling surround phase shift enable to be set to On/Off.

5.4.3.2

Configure > System > Network Configuration

To view and configure the network configuration, select the **Network Configuration** tab from the **System** web page.

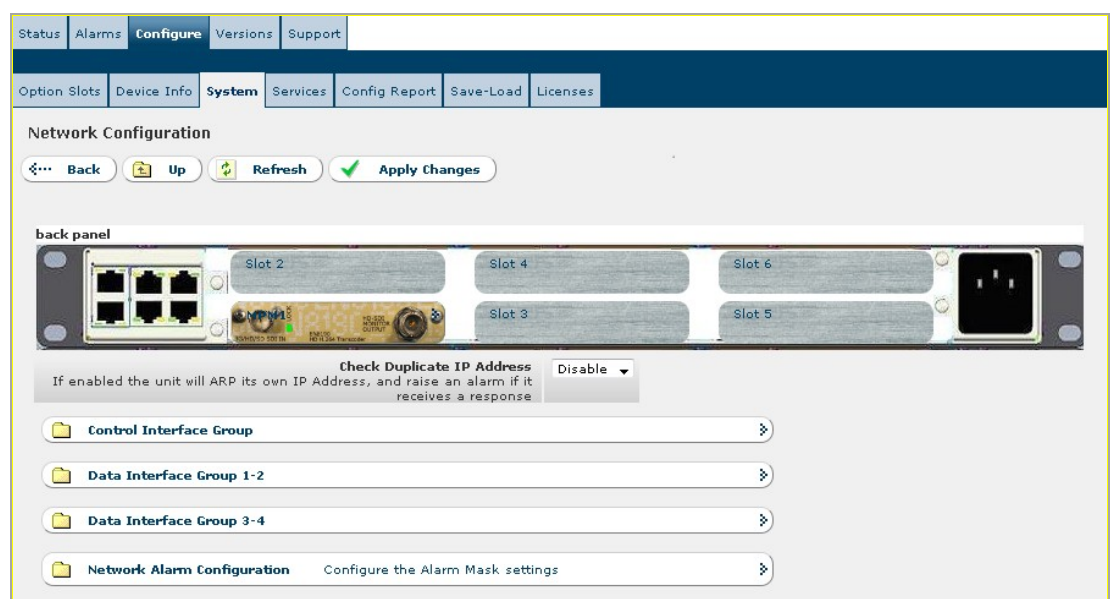


Figure 5.29 System > Network Configuration Web Page

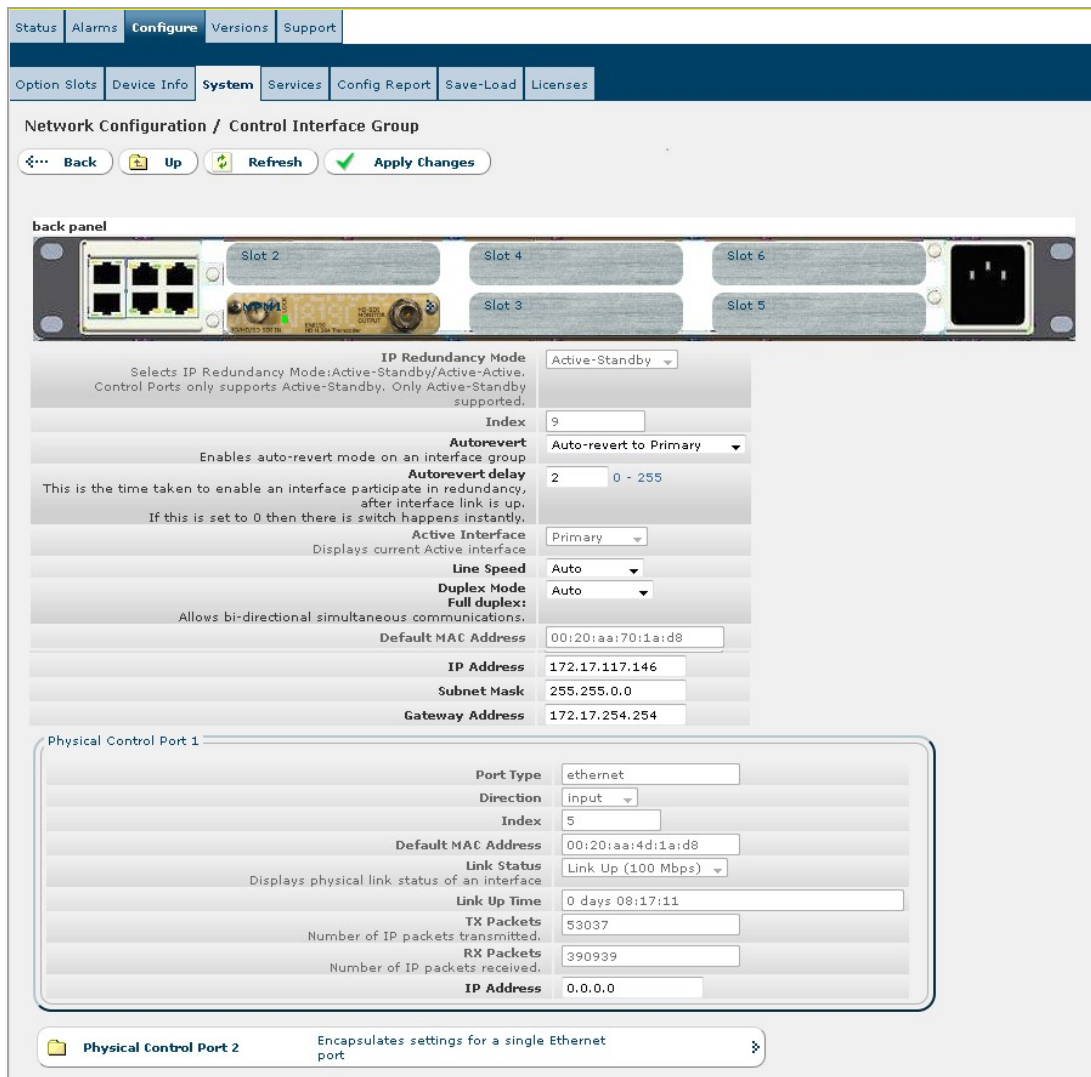
The only user-editable field on this page is as follows:

- **Check duplicate IP Address** – If this facility is enabled, the unit will ARP its own IP address and raise an alarm if it receives a response.

5.4.3.2.1

Configure > System > Network Configure > Control Interface Group

To view and configure the Control Interface Group, select the **Control Interface Group** button from the **System** web page.



Network Configuration / Control Interface Group

Back Up Refresh Apply Changes

back panel

Slot 2 Slot 4 Slot 6 Slot 3 Slot 5

IP Redundancy Mode: Active-Standby/Active-Active. Control Ports only supports Active-Standby. Only Active-Standby supported.

Index: 9

Autorevert: Auto-revert to Primary

Autorevert delay: 2 (0 - 255)

Active Interface: Primary

Line Speed: Auto

Duplex Mode: Auto

Full duplex: [checked]

Default MAC Address: 00:20:aa:70:1a:d8

IP Address: 172.17.117.146

Subnet Mask: 255.255.0.0

Gateway Address: 172.17.254.254

Physical Control Port 1

Port Type: ethernet

Direction: Input

Index: 5

Default MAC Address: 00:20:aa:4d:1a:d8

Link Status: Link Up (100 Mbps)

Link Up Time: 0 days 08:17:11

TX Packets: 53037

RX Packets: 390939

IP Address: 0.0.0.0

Physical Control Port 2: Encapsulates settings for a single Ethernet port

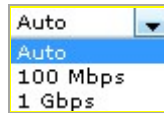
Figure 5.30 Network Configure > Control Interface Group Web Page

The following user editable fields are available from this web page.

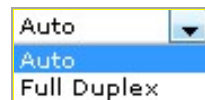
- **IP Redundancy Mode** – Selects Active/Standby or Active-Active mode.
- **Index** – Selects the Index number.
- **Autorevert** – Enables autorevert mode on an interface group.



- **Autorevert Delay** – Selects autorevert delay, 0 – 255 seconds. The time taken to enable an interface to participate in redundancy after the interface link up is established. If set to 0, the switch happen immediately.
- **Active Interface** – Displays the current active interface.
- **Line Speed** – A drop-down menu specifying the line speed.



- **Duplex Mode** – Selecting **Full Duplex** allows bi-directional simultaneous communications.



- **Default MAC Address** – Displays the default MAC address.
- **IP Address** – Enables entry of the IP address for the control port.
- **Subnet Mask** – Enables entry of the subnet mask for the control port.
- **Gateway Address** – Enables entry of the gateway address for the control port.

Physical control Port 1

- **Port Type** – displays the port type (Ethernet).
- **Direction** – displays port input or output type.
- **Index** – displays port index number.
- **Default MAC Address** – displays port default MAC address.
- **Link Status** – displays port link status (and speed).
- **Link-up Time** – displays the time that that link has been established.
- **Tx Packets** – displays number of IP packets transmitted.
- **Rx Packets** – displays number of IP packets received.
- **IP Address** – displays port IP address.

Configure > System > Network Configure > Control Interface Group > Physical Control Port 2

To edit the parameters of Port 2, select the **Physical Control Port 2** button from the **Control Interface Group** page. The following page is displayed and contains user-editable fields similar to those shown in *Figure 5.30*.

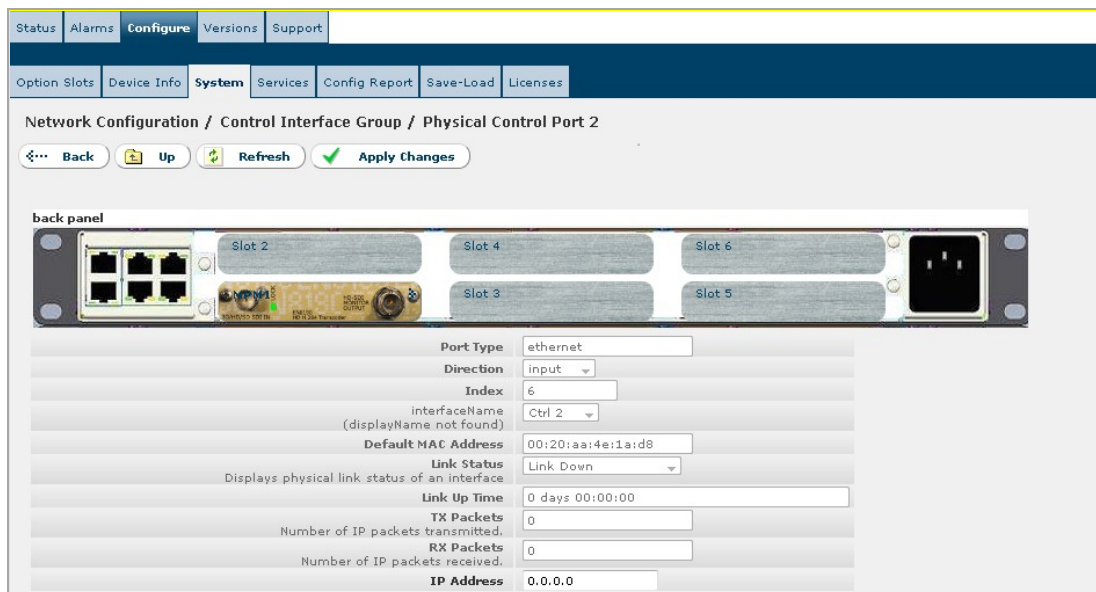
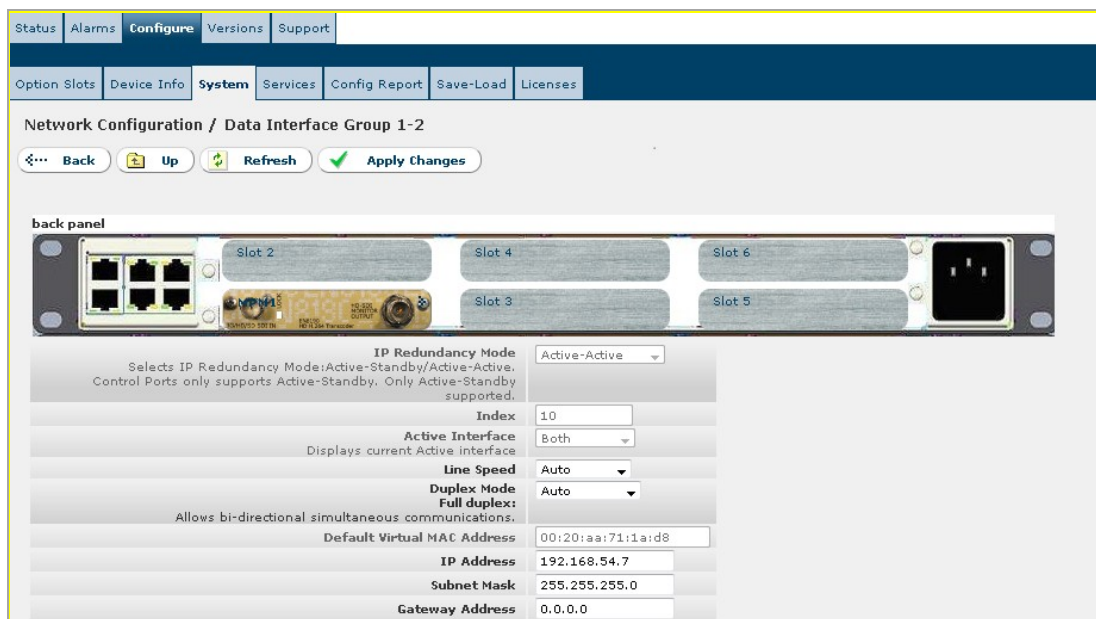


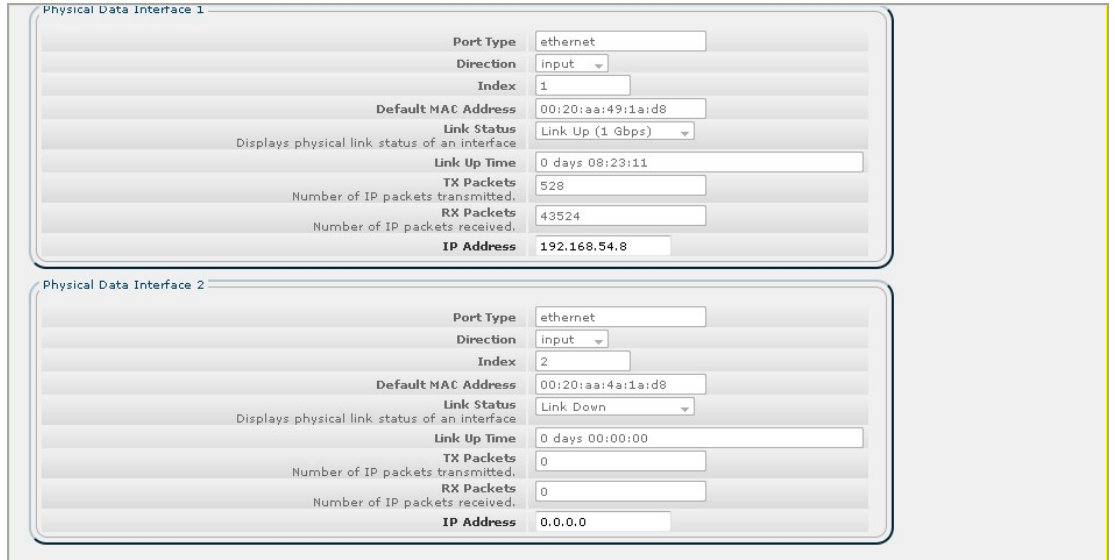
Figure 5.31 Control Interface Group > Physical Control Port 2

5.4.3.2.2

Configure > System > Network Configure > Data Interface Group 1-2

To view and configure the Data Interface Group, select the **Data Interface Group 1-2** button from the **Network Configuration** web page.





Field	Physical Data Interface 1	Physical Data Interface 2
Port Type	ethernet	ethernet
Direction	input	input
Index	1	2
Default MAC Address	00:20:aa:49:1a:d8	00:20:aa:4a:1a:d8
Link Status	Link Up (1 Gbps)	Link Down
Link Up Time	0 days 08:23:11	0 days 00:00:00
TX Packets	528	0
RX Packets	43524	0
IP Address	192.168.54.8	0.0.0.0

Figure 5.32 Network Configure > Data Interface Group 1-2

See Section 5.4.3.2.1 for details of user-editable fields.

5.4.3.2.3 Configure > System > Network Configure > Data Interface Group 3-4

Data Interface Group 3-4 is the output Ethernet interface. It can operate in **active-standby** and **active-active** modes. In active-active, it can additionally operate in **same network** mode or **different network** mode.

Note: Changing between these modes will require the unit to be rebooted for the change to take effect. You will be prompted for this.

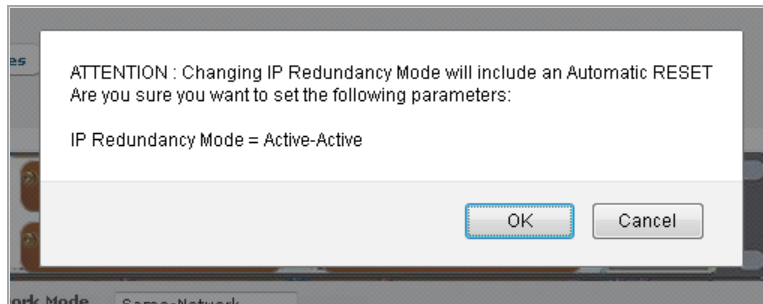


Figure 5.33 Prompt for Changing IP Redundancy Mode.

Active/Active, Same Network

Figure 5.34 shows the web page settings for **active-active, same network** mode.

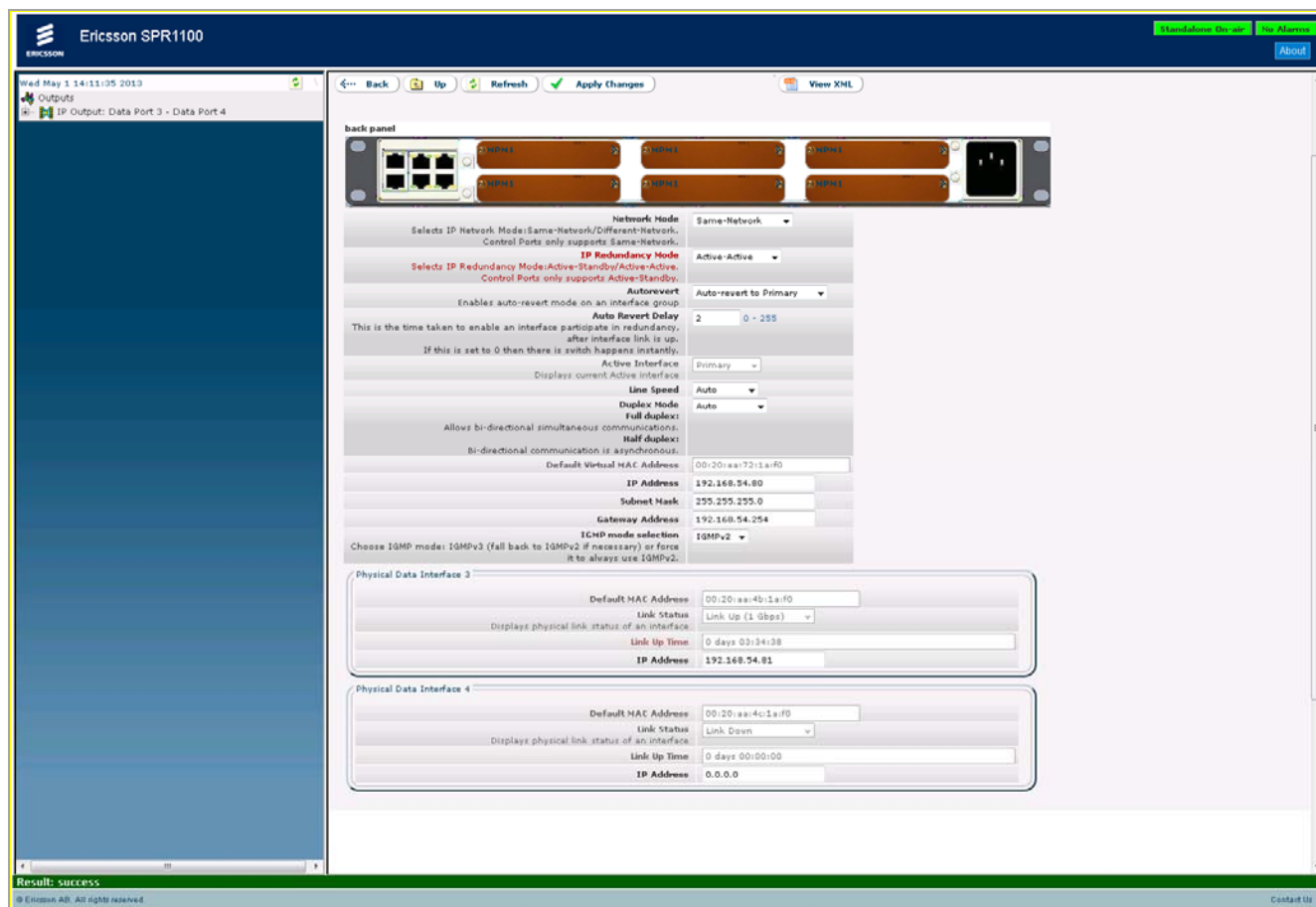


Figure 5.34 Active-Active, Same Network: Data Interface Group 3-4

Active-Active, Different Network

Figure 5.35 shows the web page settings for **active-active, different network** mode.

In **different network** mode, the virtual IP address, network mask and gateway address must be set individually for each multicast output. The configuration of these items is thus not available on this screen, but must be set in the **Services > Properties > Transport Stream** pane.

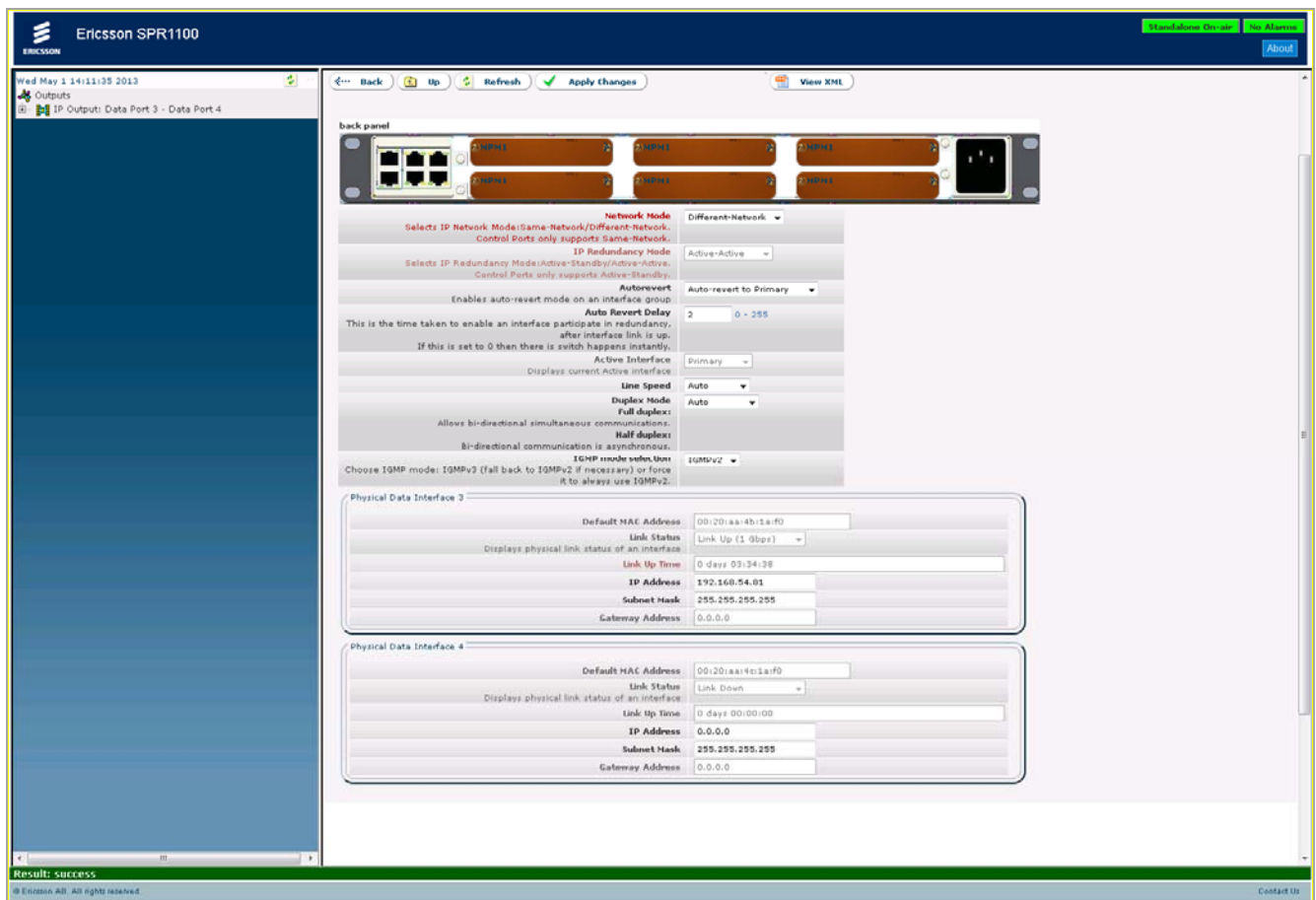
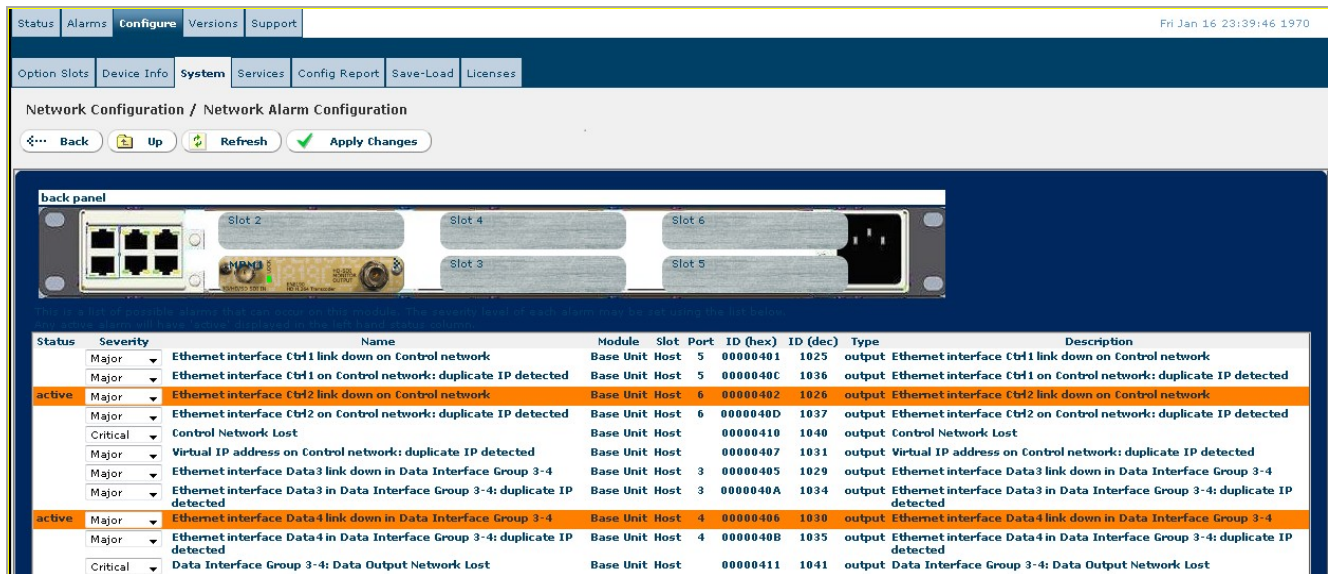


Figure 5.35 Active-Active, Different Network: Data Interface Group 3-4

5.4.3.2.4 Configure > System > Network Configure > Network Alarm Configuration

To view and configure the Network Alarms, select the **Network Alarm Configuration** button from the **Network Configuration** web page.



Status	Severity	Name	Module	Slot	Port	ID (hex)	ID (dec)	Type	Description
	Major	Ethernet interface Ctr1 link down on Control network	Base Unit	Host	5	00000401	1025	output	Ethernet interface Ctr1 link down on Control network
	Major	Ethernet interface Ctr1 on Control network: duplicate IP detected	Base Unit	Host	5	0000040C	1036	output	Ethernet interface Ctr1 on Control network: duplicate IP detected
active	Major	Ethernet interface Ctr2 link down on Control network	Base Unit	Host	6	00000402	1026	output	Ethernet interface Ctr2 link down on Control network
	Major	Ethernet interface Ctr2 on Control network: duplicate IP detected	Base Unit	Host	6	0000040D	1037	output	Ethernet interface Ctr2 on Control network: duplicate IP detected
	Critical	Control Network Lost	Base Unit	Host		00000410	1040	output	Control Network Lost
	Major	Virtual IP address on Control network: duplicate IP detected	Base Unit	Host		00000407	1031	output	Virtual IP address on Control network: duplicate IP detected
	Major	Ethernet interface Data3 link down in Data Interface Group 3-4	Base Unit	Host	3	00000405	1029	output	Ethernet interface Data3 link down in Data Interface Group 3-4
	Major	Ethernet interface Data3 in Data Interface Group 3-4: duplicate IP detected	Base Unit	Host	3	0000040A	1034	output	Ethernet interface Data3 in Data Interface Group 3-4: duplicate IP detected
active	Major	Ethernet interface Data4 link down in Data Interface Group 3-4	Base Unit	Host	4	00000406	1030	output	Ethernet interface Data4 link down in Data Interface Group 3-4
	Major	Ethernet interface Data4 in Data Interface Group 3-4: duplicate IP detected	Base Unit	Host	4	0000040B	1035	output	Ethernet interface Data4 in Data Interface Group 3-4: duplicate IP detected
	Critical	Data Interface Group 3-4: Data Output Network Lost	Base Unit	Host		00000411	1041	output	Data Interface Group 3-4: Data Output Network Lost

Figure 5.36 Network Alarm Configuration Web Page

This page displays a list of network alarms that are currently configured and all the details of those alarms. Those alarms which are currently active are colored **orange**.

The column showing the **Severity** of the alarm comprises a drop down menu (similar to that shown in Figure 5.13) that enables you to change the setting.

5.4.3.3 Configure > System > Option Slots Status

To view Option Slots Status, select the **Option Slots Status** button from the **System** web page.

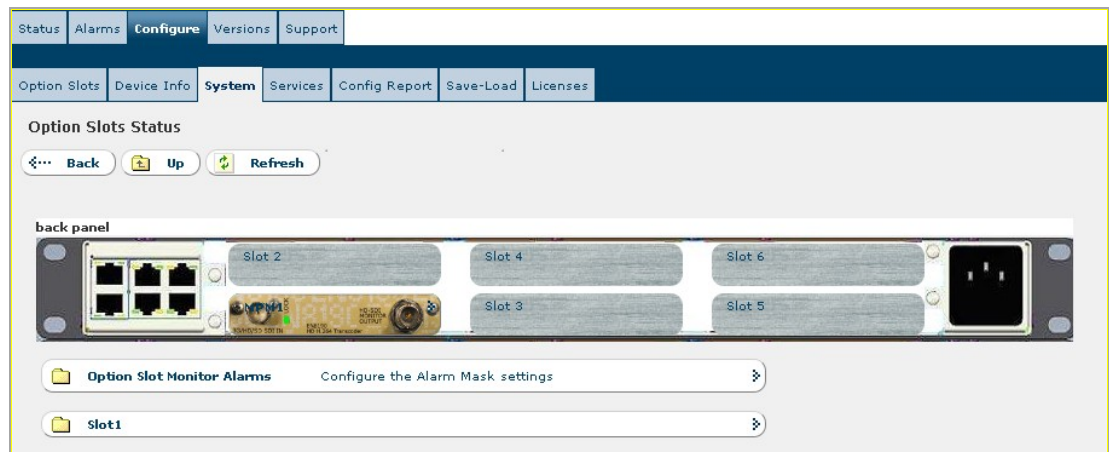
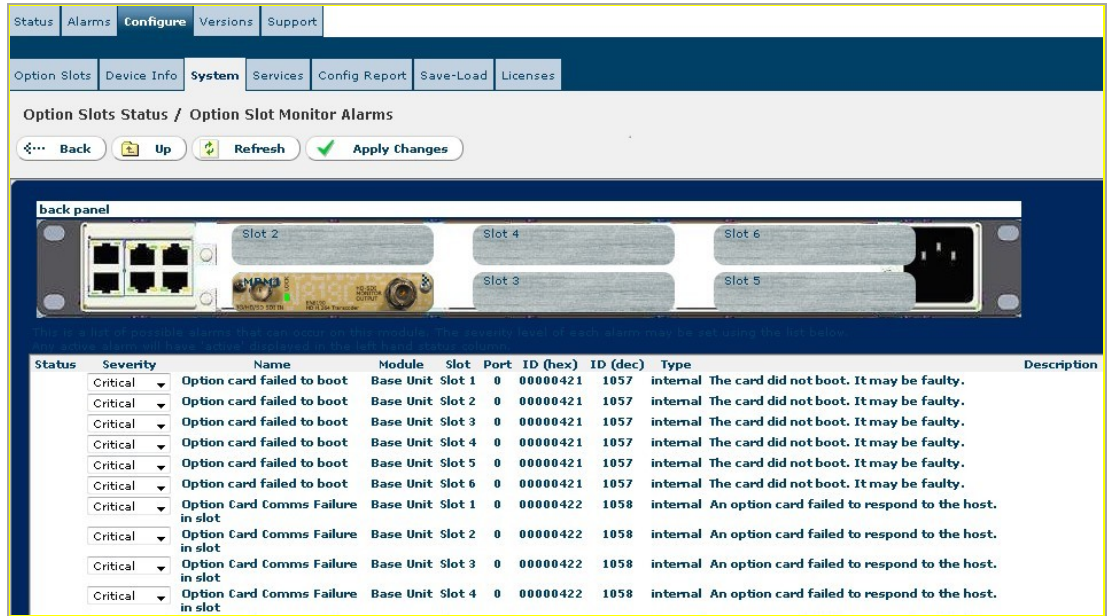


Figure 5.37 System > Option Slots Status Web Page

5.4.3.3.1 Configure > System > Option Slots Status > Option Slot Monitor Alarms

To configure the Alarm Mask Settings, select the **Option Slot Monitor Alarms** button from the **Option Slots Status** web page.



Status	Severity	Name	Module	Slot	Port	ID (hex)	ID (dec)	Type	Description
	Critical	Option card failed to boot	Base Unit	Slot 1	0	00000421	1057	internal	The card did not boot. It may be faulty.
	Critical	Option card failed to boot	Base Unit	Slot 2	0	00000421	1057	internal	The card did not boot. It may be faulty.
	Critical	Option card failed to boot	Base Unit	Slot 3	0	00000421	1057	internal	The card did not boot. It may be faulty.
	Critical	Option card failed to boot	Base Unit	Slot 4	0	00000421	1057	internal	The card did not boot. It may be faulty.
	Critical	Option card failed to boot	Base Unit	Slot 5	0	00000421	1057	internal	The card did not boot. It may be faulty.
	Critical	Option card failed to boot	Base Unit	Slot 6	0	00000421	1057	internal	The card did not boot. It may be faulty.
	Critical	Option Card Comms Failure in slot	Base Unit	Slot 1	0	00000422	1058	internal	An option card failed to respond to the host.
	Critical	Option Card Comms Failure in slot	Base Unit	Slot 2	0	00000422	1058	internal	An option card failed to respond to the host.
	Critical	Option Card Comms Failure in slot	Base Unit	Slot 3	0	00000422	1058	internal	An option card failed to respond to the host.
	Critical	Option Card Comms Failure in slot	Base Unit	Slot 4	0	00000422	1058	internal	An option card failed to respond to the host.

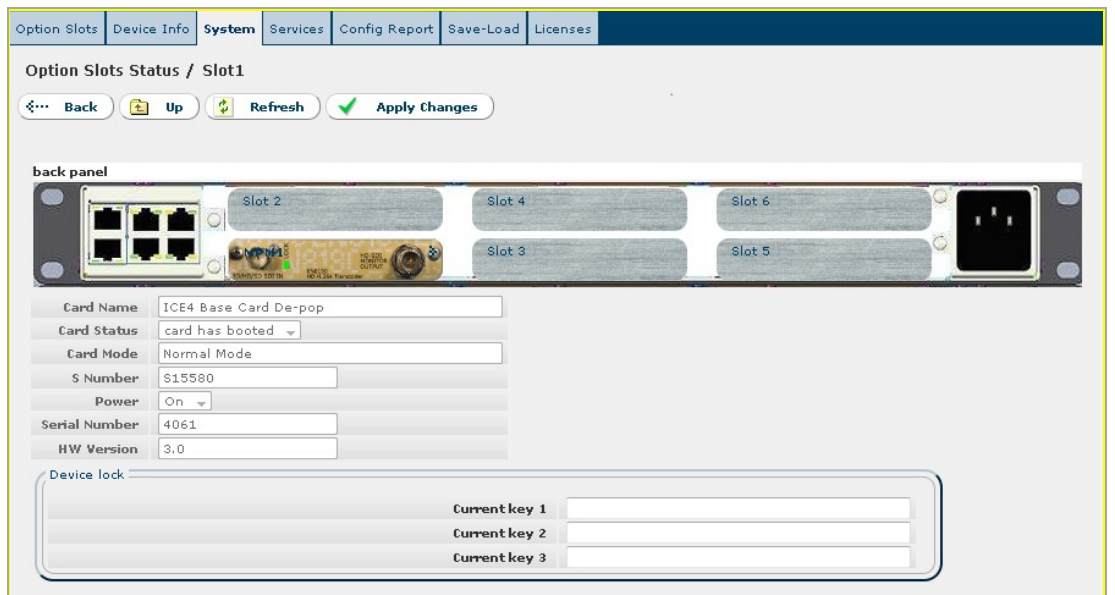
Figure 5.38 Option Slots Status > Option Monitor Alarms Web Page

The column showing the **Severity** of the alarm comprises a drop down menu (similar to that shown in Figure 5.13) that enables you to change the setting.

5.4.3.3.2

Configure > System > Option Slots Status > Slot 1

To view the Slot 1 parameters, select the **Slot 1** button from the **Option Slots Status** web page.



Option Slots Status / Slot1

Back Up Refresh Apply Changes

back panel

Card Name: ICE4 Base Card De-pop

Card Status: card has booted

Card Mode: Normal Mode

S Number: S15580

Power: On

Serial Number: 4061

HW Version: 3.0

Device lock

Current key 1

Current key 2

Current key 3

Figure 5.39 Option Slots Status > Slot 1 Web Page

The following fields are available on this web page:

- **Card Name** – Name of the module inserted in Slot 1.

- **Card Status** – Indicates whether module has booted or not.
- **Card Mode** – Indicates the module mode.
- **S-Number** – Indicates the module S-number.
- **Power** – Indicates power status.
- **Serial Number** – Indicates module serial number.
- **HW Version** – Indicates module hardware version number.

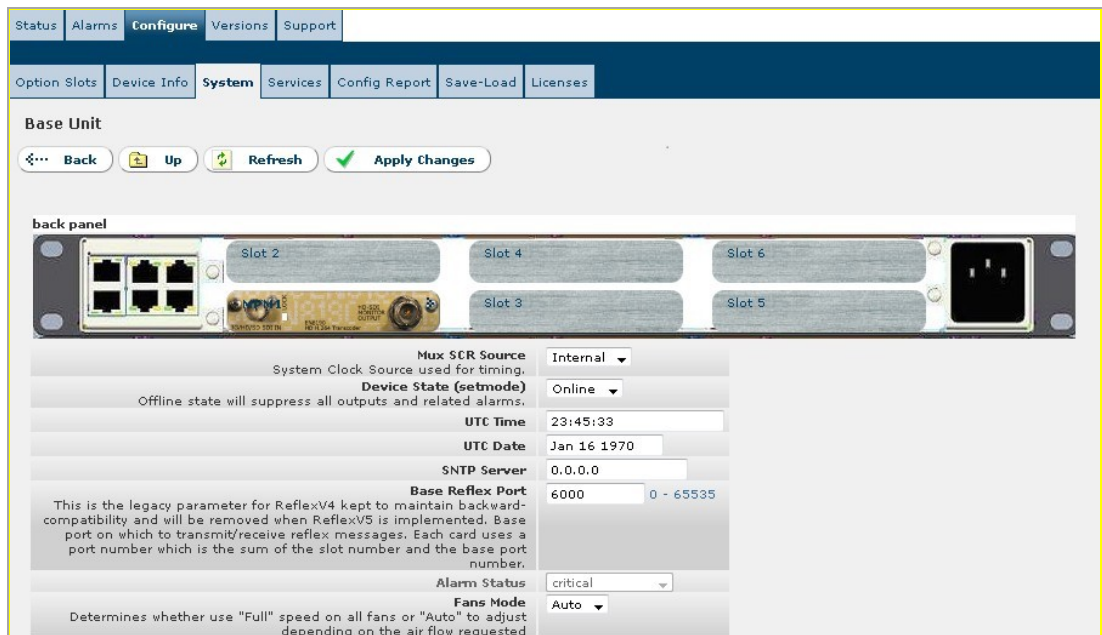
Device Lock Section

- **Current Key 1/2/3** – Enables entry of a key to lock the device.

5.4.3.4

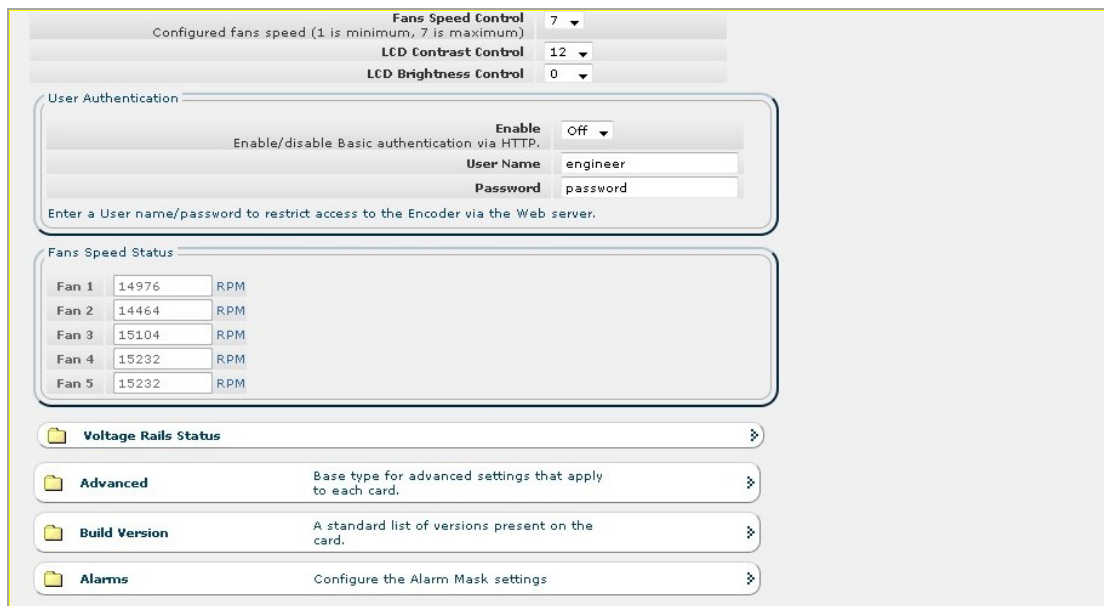
Configure > System > Base Unit

To view and edit the base unit parameters, select the **Base Unit** button from the **System** web page.



The screenshot displays the 'Base Unit' configuration page. At the top, there are tabs for 'Status', 'Alarms', 'Configure' (selected), 'Versions', and 'Support'. Below these are sub-tabs: 'Option Slots', 'Device Info', 'System' (selected), 'Services', 'Config Report', 'Save-Load', and 'Licenses'. The main heading is 'Base Unit'. Below the heading are buttons for 'Back', 'Up', 'Refresh', and 'Apply Changes'. A diagram of the 'back panel' shows slots 2, 3, 4, 5, and 6. Below the diagram, the configuration fields are as follows:

Mux SCR Source	Internal
System Clock Source used for timing.	
Device State (setmode)	Online
Offline state will suppress all outputs and related alarms.	
UTC Time	23:45:33
UTC Date	Jan 16 1970
SNTP Server	0.0.0.0
Base Reflex Port	6000 0 - 65535
This is the legacy parameter for ReflexV4 kept to maintain backward-compatibility and will be removed when ReflexV5 is implemented. Base port on which to transmit/receive reflex messages. Each card uses a port number which is the sum of the slot number and the base port number.	
Alarm Status	critical
Fans Mode	Auto
Determines whether use "Full" speed on all fans or "Auto" to adjust depending on the air flow requested	



The screenshot displays the 'System > Base Unit Web Page' with the following sections:

- Fans Speed Control:** Configured fans speed (1 is minimum, 7 is maximum) set to 7.
- LCD Contrast Control:** Set to 12.
- LCD Brightness Control:** Set to 0.
- User Authentication:**
 - Enable:** Off (dropdown).
 - Enable/disable Basic authentication via HTTP:** (text label).
 - User Name:** engineer
 - Password:** password
 - Instruction:** Enter a User name/password to restrict access to the Encoder via the Web server.
- Fans Speed Status:**

Fan 1	14976	RPM
Fan 2	14464	RPM
Fan 3	15104	RPM
Fan 4	15232	RPM
Fan 5	15232	RPM
- Voltage Rails Status:** (expandable section)
- Advanced:** Base type for advanced settings that apply to each card. (expandable section)
- Build Version:** A standard list of versions present on the card. (expandable section)
- Alarms:** Configure the Alarm Mask settings. (expandable section)

Figure 5.40 System > Base Unit Web Page

The following fields, not all of which are user editable, are available from this page:

- **MUX SCR Source** – Allows selection of System Clock Source.
- **Device State (setmode)** – allows setting of mode to offline or online. Selection of Offline will suppress all outputs and related alarms.
- **UTC Time** – Current Universal Time Code (UTC) time.
- **UTC Date** – Current Universal Time Code (UTC) Date.
- **SNTP Server** – SNTP server IP address.
- **Base Reflex Port** – Base port on which to transmit/receive reflex messages.
- **Alarm status** – Allows the setting of the alarm default status
- **Fans Mode** – Allows the selection of Full speed or Auto. In Auto mode, fans will adjust depending on airflow required.
- **Fan Speed Control** – Configured fan speed, 1 is minimum, 7 is maximum.
- **LCD Contrast Control** – Numerical contrast control.
- **LCD Brightness Control** – Numerical brightness control.

User Authentication Section

- **Enable** – Enable/disable basic authentication via HTTP.
- **User Name/Password** – entering a user name and password will restrict access to the encoder via the web server.

The Fan Speed Status fields give information on the current speed of each of the 5 configured fans, in revolutions per minute (rpm).

The remaining buttons are described in the following sections.

5.4.3.4.1 Configure > System > Base Unit > Voltage Rails Status

To view the status of the voltage rails, select the **Voltage Rails Status** button from the **Base Unit** web page.

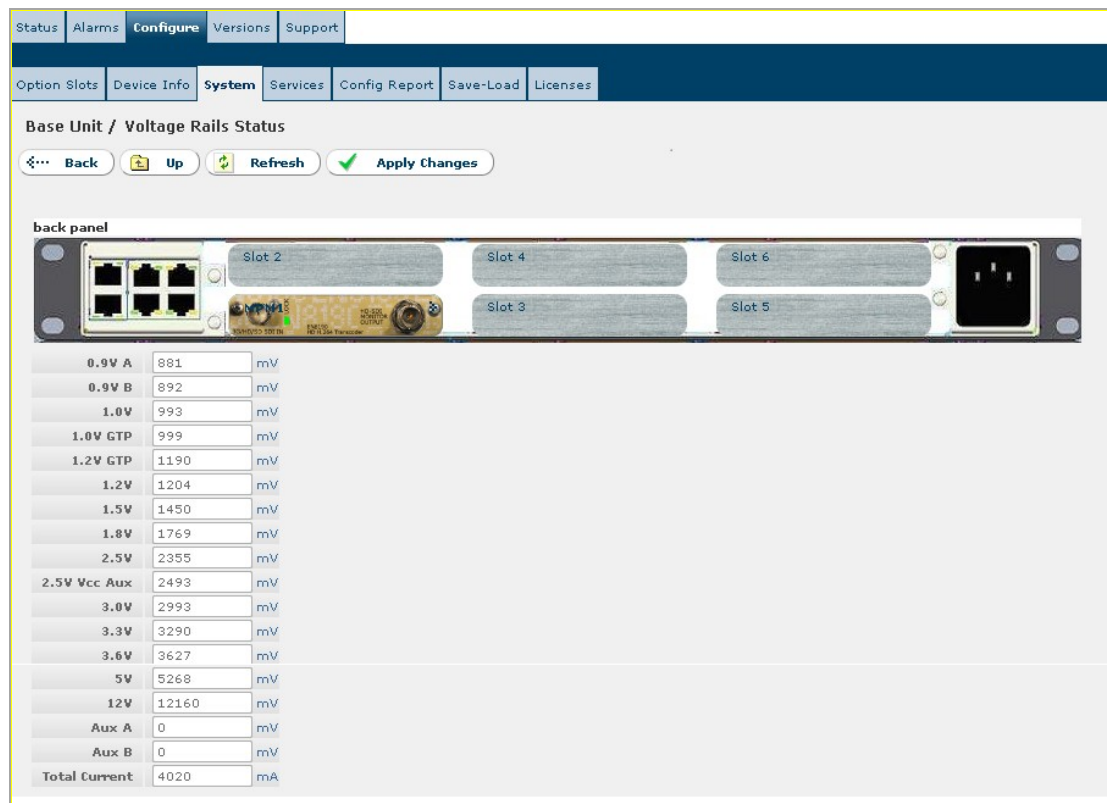
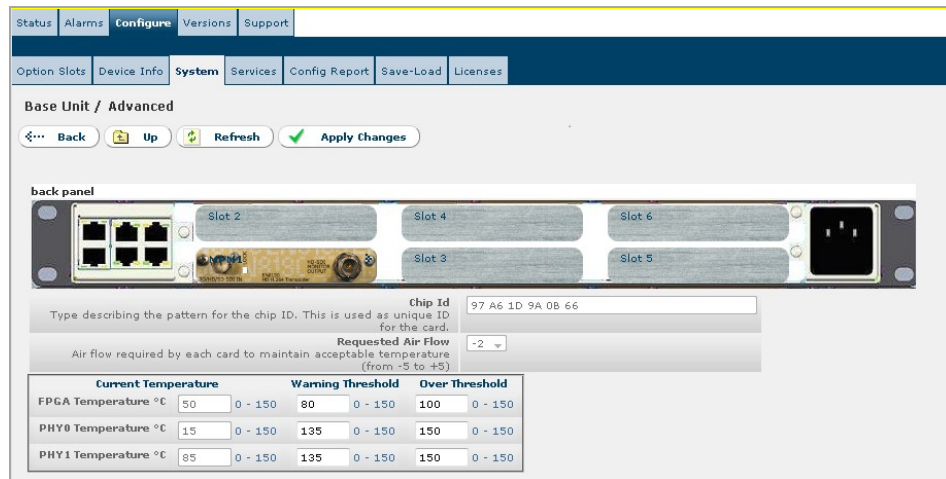


Figure 5.41 Base Unit > Voltage Rails Status Web Page

5.4.3.4.2 Configure > System > Base Unit > Advanced

To view the advanced settings that apply to each module, select the **Advanced** button from the **Base Unit** web page.



Base Unit / Advanced

back panel

Chip Id 97 A6 1D 9A 0B 66

Requested Air Flow -2

	Current Temperature	Warning Threshold	Over Threshold
FPGA Temperature °C	50 0 - 150	80 0 - 150	100 0 - 150
PHY0 Temperature °C	15 0 - 150	135 0 - 150	150 0 - 150
PHY1 Temperature °C	85 0 - 150	135 0 - 150	150 0 - 150

Figure 5.42 Base Unit > Advanced Web Page

The following fields are displayed on this web page:

- **Chip Id** – Describes the pattern for the chip Id which is a unique identifier for that particular module.
- **Requested Air Flow** – The air flow required by each module to maintain an acceptable temperature (-5 to +5).

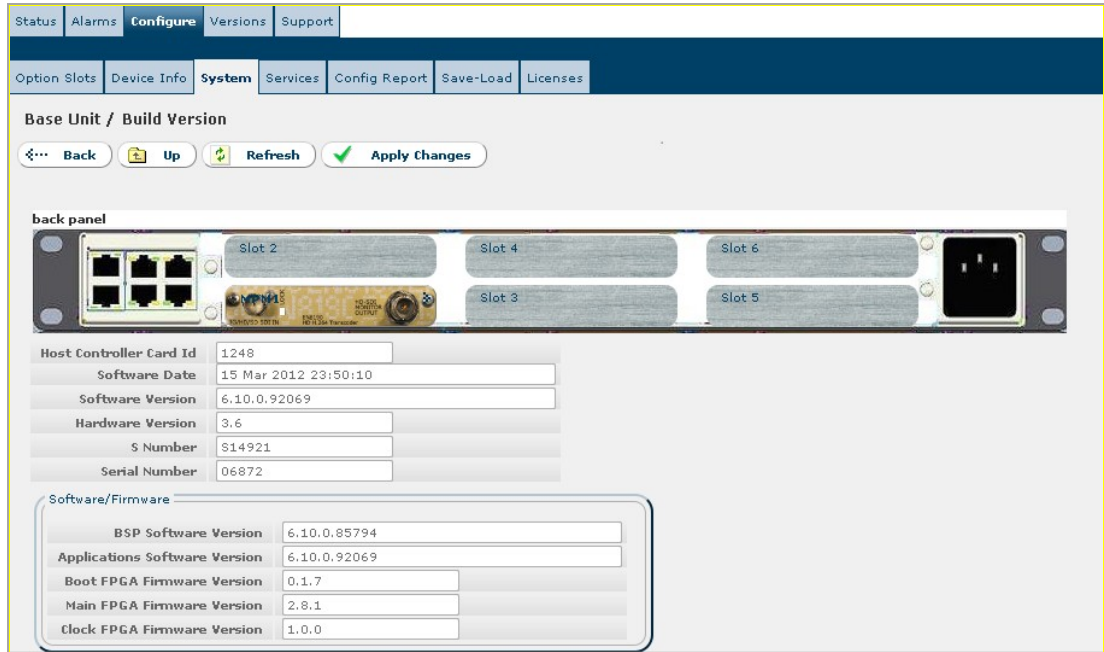
Temperature Section

- **FPGA/PHY1/PHY2 Temperature** – Shows the current temperature, warning threshold and over threshold of these facilities.

5.4.3.4.3

Configure > System > Base Unit > Build Version

To view a standard list of versions present on the module, select the **Build Version** button from the **Base Unit** web page.



Base Unit / Build Version	
Host Controller Card Id	1248
Software Date	15 Mar 2012 23:50:10
Software Version	6.10.0.92069
Hardware Version	3.6
S Number	S14921
Serial Number	06872

Software/Firmware	
BSP Software Version	6.10.0.85794
Applications Software Version	6.10.0.92069
Boot FPGA Firmware Version	0.1.7
Main FPGA Firmware Version	2.8.1
Clock FPGA Firmware Version	1.0.0

Figure 5.43 Base Unit > Build Version Web Page

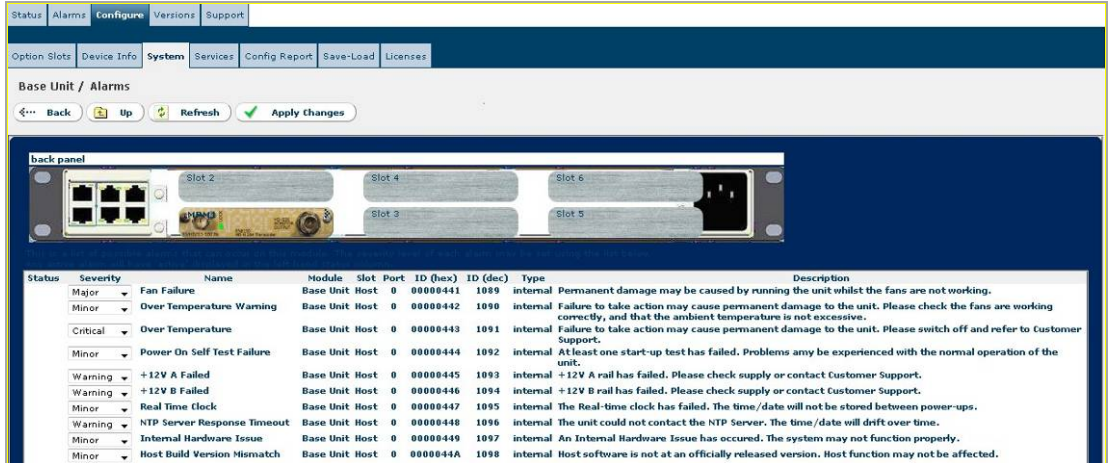
The following read-only fields are available on this page:

- **Host Controller Card Id** – Unique card Identifier.
- **Software Date** – Date/time software was compiled.
- **Software Version** – Software version number.
- **Hardware Version** – Hardware version number.
- **S Number** – Displays the s-number.
- **Serial Number** – Displays the serial number.

The Software/Firmware section gives details of the versions of Software and Firmware used on various components of the unit.

5.4.3.4.4 Configure > System > Base Unit > Alarms

To configure the alarm masks for the base unit alarms, select the **Alarms** button from the **Base Unit** page.



Status	Severity	Name	Module	Slot	Port	ID (hex)	ID (dec)	Type	Description
Major	Fan Failure		Base Unit	Host	0	00000441	1089	internal	Permanent damage may be caused by running the unit whilst the fans are not working.
Minor	Over Temperature Warning		Base Unit	Host	0	00000442	1090	internal	Failure to take action may cause permanent damage to the unit. Please check the fans are working correctly, and that the ambient temperature is not excessive.
Critical	Over Temperature		Base Unit	Host	0	00000443	1091	internal	Failure to take action may cause permanent damage to the unit. Please switch off and refer to Customer Support.
Minor	Power On Self Test Failure		Base Unit	Host	0	00000444	1092	internal	At least one start-up test has failed. Problems may be experienced with the normal operation of the unit.
Warning	+12V A Failed		Base Unit	Host	0	00000445	1093	internal	+12V A rail has failed. Please check supply or contact Customer Support.
Warning	+12V B Failed		Base Unit	Host	0	00000446	1094	internal	+12V B rail has failed. Please check supply or contact Customer Support.
Minor	Real Time Clock		Base Unit	Host	0	00000447	1095	internal	The Real-time clock has failed. The time/date will not be stored between power-ups.
Warning	NTP Server Response Timeout		Base Unit	Host	0	00000448	1096	internal	The unit could not contact the NTP Server. The time/date will drift over time.
Minor	Internal Hardware Issue		Base Unit	Host	0	00000449	1097	internal	An Internal Hardware Issue has occurred. The system may not function properly.
Minor	Host Build Version Mismatch		Base Unit	Host	0	0000044A	1098	internal	Host software is not at an officially released version. Host function may not be affected.

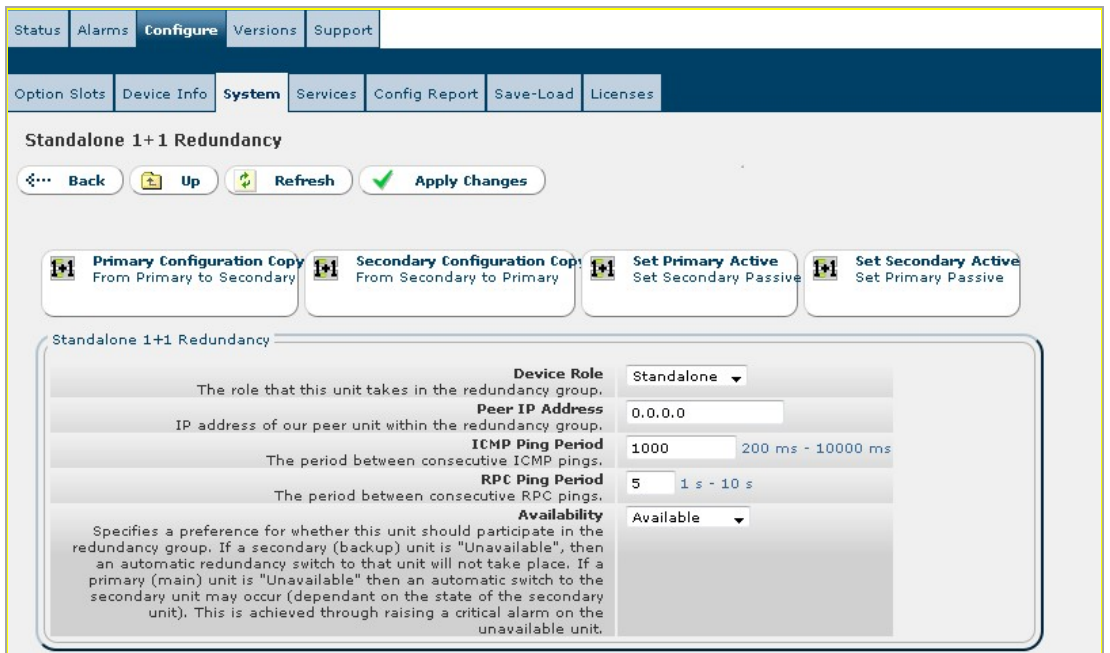
Figure 5.44 Base Unit > Alarms Web Page

The column showing the **Severity** of the alarm comprises a drop down menu (similar to that shown in Figure 5.13) that enables you to change the setting.

5.4.3.5

Configure > System > Standalone 1+1 Redundancy

To view and edit the Standalone 1+1 Redundancy parameters, select the **Standalone 1+1 Redundancy** button from the **System** web page.



Standalone 1+1 Redundancy

The role that this unit takes in the redundancy group.

Device Role Standalone

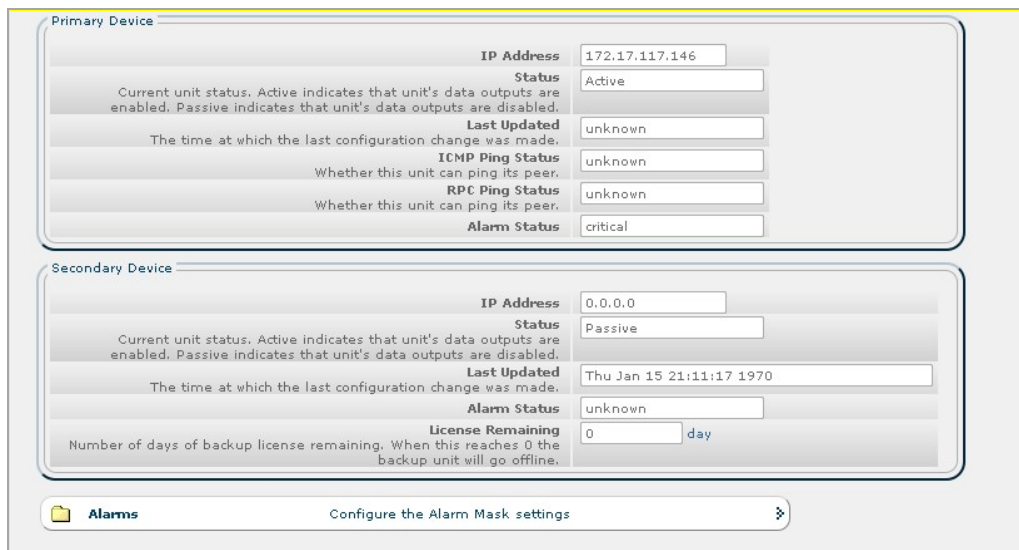
Peer IP Address 0.0.0.0

ICMP Ping Period 1000 200 ms - 10000 ms

RPC Ping Period 5 1 s - 10 s

Availability Available

Specifies a preference for whether this unit should participate in the redundancy group. If a secondary (backup) unit is "Unavailable", then an automatic redundancy switch to that unit will not take place. If a primary (main) unit is "Unavailable" then an automatic switch to the secondary unit may occur (dependant on the state of the secondary unit). This is achieved through raising a critical alarm on the unavailable unit.



Primary Device

IP Address: 172.17.117.146

Status: Active
Current unit status. Active indicates that unit's data outputs are enabled. Passive indicates that unit's data outputs are disabled.

Last Updated: unknown
The time at which the last configuration change was made.

ICMP Ping Status: unknown
Whether this unit can ping its peer.

RPC Ping Status: unknown
Whether this unit can ping its peer.

Alarm Status: critical

Secondary Device

IP Address: 0.0.0.0

Status: Passive
Current unit status. Active indicates that unit's data outputs are enabled. Passive indicates that unit's data outputs are disabled.

Last Updated: Thu Jan 15 21:11:17 1970
The time at which the last configuration change was made.

Alarm Status: unknown

License Remaining: 0 day
Number of days of backup license remaining. When this reaches 0 the backup unit will go offline.

Alarms [Configure the Alarm Mask settings](#)

Figure 5.45 System > Standalone 1+1 Redundancy Web Page

The following fields are available on this page:

- **Device Role** – Role this unit takes in the redundancy group.
- **Peer IP Address** – Address of the peer unit within the redundancy group.
- **ICMP Ping Period** – The period between consecutive ICMP pings.
- **RPC Ping Period** – The period between consecutive RPC pings.
- **Availability** – Specifies a preference as to whether this unit should participate in the redundancy group. If a secondary backup unit is unavailable, then an automatic redundancy switch to that unit will not take place. If a primary (main) unit is unavailable then an automatic switch to the secondary unit may occur (depending on the state of the secondary unit). This is achieved through raising a critical alarm on the unavailable unit.

Primary Device Section

- **IP Address** – IP address of the Primary unit.
- **Status** – Current unit status. Active indicates that all the unit's data outputs are enabled while Passive indicates that they are disabled.
- **Last Updated** – The time at which the last configuration change was made.
- **IMPC Ping Status** – Displays whether this unit can ping its peer.
- **RPC Ping Status** – Displays whether this unit can ping its peer.
- **Alarm Status** – Status of Primary unit alarm.

Secondary Device Section:

- **IP Address** – IP address of the secondary unit.

- **Status** – Current unit status. Active indicates that all the unit's data outputs are enabled while Passive indicates that they are disabled.
- **Last Updated** – The time at which the last configuration change was made.
- **Alarm Status** – Status of Secondary unit alarm.
- **License Remaining** – Number of days of backup license remaining. When this reaches 0 the backup unit will go offline.

5.4.3.5.1 Configure > System > Standalone 1+1 Redundancy > Alarms

To configure the alarm masks, select the **Alarms** button from the **Standalone 1+1 Redundancy** page.



Status	Severity	Name	Module	Slot	Port	ID (hex)	ID (dec)	Type	Description
	Major	Lost Contact With Peer	Base Unit	Host	0	00000521	1313	input	This unit is not able to contact its redundancy peer. Check that peer IP address is correct, control network connections are correct and that peer working correctly.
	Critical	Unit Unavailable	Base Unit	Host	0	00000522	1314	input	This unit has been configured to be Unavailable. This means it will not take part in the 1 + 1 redundancy group.
	Major	Configuration Mismatch	Base Unit	Host	0	00000523	1315	input	The configuration settings of units in the 1 + 1 redundancy group may not match. To clear this alarm, copy the configuration settings from one unit to the other unit using buttons on the "Standalone 1 + 1 Redundancy" configuration settings to copy the up-to-date configuration settings to the other unit.
	Major	Redundant Secondary Active	Base Unit	Host	0	00000524	1316	input	The redundant secondary is active. This will be eroding the timed license on the secondary unit. Repair the primary and switch back to it as soon as possible. To switch back to the primary use the button on the "Standalone 1 + 1 Redundancy" configuration settings.
	Critical	Version Mismatch	Base Unit	Host	0	00000525	1317	input	The software version, hardware configuration or hardware version of units in the 1 + 1 redundancy group are not identical. The secondary unit will not be able to act as a redundant spare. This alarm will only be raised on a secondary unit, even though the secondary may contain the desired configuration.
	Critical	License Nearly Expired	Base Unit	Host	0	00000526	1318	input	The 1 + 1 redundancy backup license is close to expiring. If it expires, the secondary unit will not be able to act as a redundant spare. Contact support to renew the license.
	Critical	License Expired	Base Unit	Host	0	00000527	1319	input	The 1 + 1 redundancy backup license has expired. The secondary unit is not able to act as a redundant spare. The video data outputs of the secondary unit have been disabled. Contact support to renew the license.
	Major	Redundancy Parameters Unavailable	Base Unit	Host	0	00000528	1320	input	The redundancy configuration parameters have not been configured correctly (either on this unit or the peer unit).
	Major	Conflicting Roles	Base Unit	Host	0	00000529	1321	input	The primary and secondary "Device Roles" are in conflict. For a valid redundancy group there must be exactly 1 unit with "Primary" role and 1 unit with "Secondary" role. Check the "Device Role" setting on your primary and secondary units.
	Major	Conflicting IP Addresses	Base Unit	Host	0	0000052A	1322	input	The primary and secondary IP address configurations are in conflict. Ensure that the "Peer IP Address" setting on each unit is correctly configured with the control IP address of its peer.

Figure 5.46 Standalone 1+1 Redundancy > Alarms Web Page

The column showing the **Severity** of the alarm comprises a drop down menu (similar to that shown in *Figure 5.13*) that enables you to change the setting.

5.4.3.6 Configure > System > IP Input Redundancy Switching Parameters

This page gives access to an automatic redundancy switch which enables you to select whether automatic switching is enabled between redundant IP input streams. To display, select the **IP Input Redundancy Switching Parameters** button from the **System** web page.

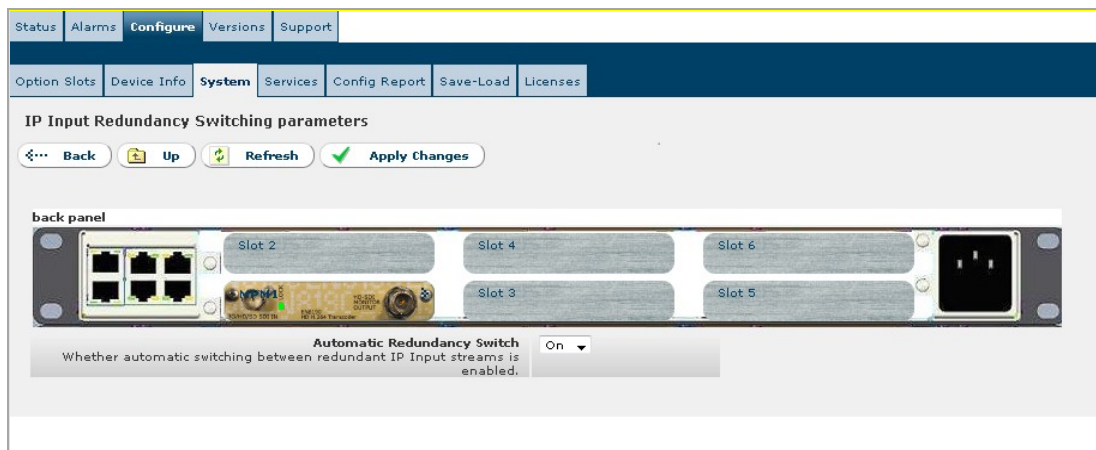


Figure 5.47 System > IP Input Redundancy Switching Parameters > Web Page

5.4.3.7 Configure > System > MGP support

To view and edit the MGP Support parameters, select the **MGP support** button from the **System** web page.

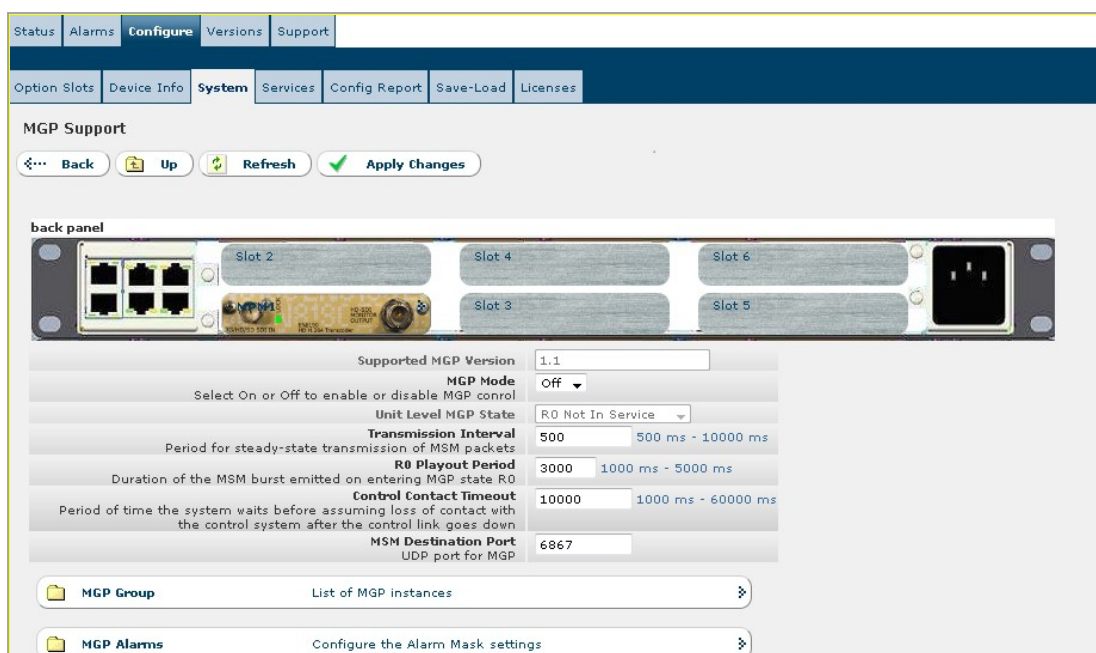


Figure 5.48 System > MGP Support Web Page

5.4.3.7.1 Configure > System > MGP Support > MGP Group

To view and edit the MGP Group parameters, select the **MGP Group** button from the **MGP Support** web page.

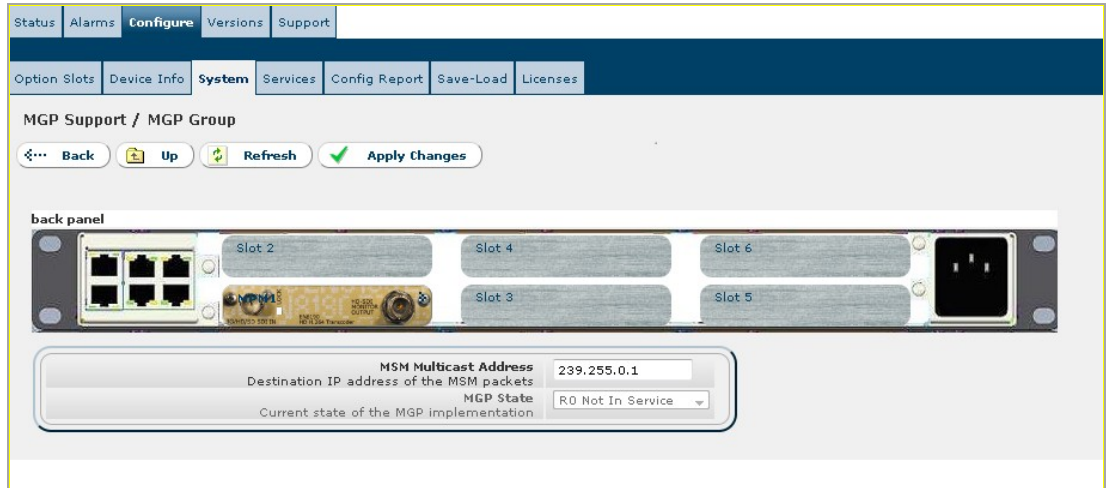


Figure 5.49 MGP Support > MGP Group Web Page

The following fields are available from this web page:

- **MSM Multicast Address** – Destination IP address of the MSM Packets.
- **MGP State** – Current State of the MGP implementation.

5.4.3.7.2

Configure > System > MGP Support > MGP Alarms

To view list of MGP alarms, select the **MGP Alarms** button from the **MGP Support** web page.



Figure 5.50 MGP Support > MGP Alarms Web Page

This page displays a list of MGP alarms that are currently configured and all the details of those alarms. Those alarms which are currently active are colored **orange**.

The column showing the **Severity** of the alarm comprises a drop down menu (similar to that shown in Figure 5.13) that enables you to change the setting.

5.4.3.8 Configure > System > SNMP

To view and edit the SNMP Parameters, select the **SNMP** parameters from the **System** web page.

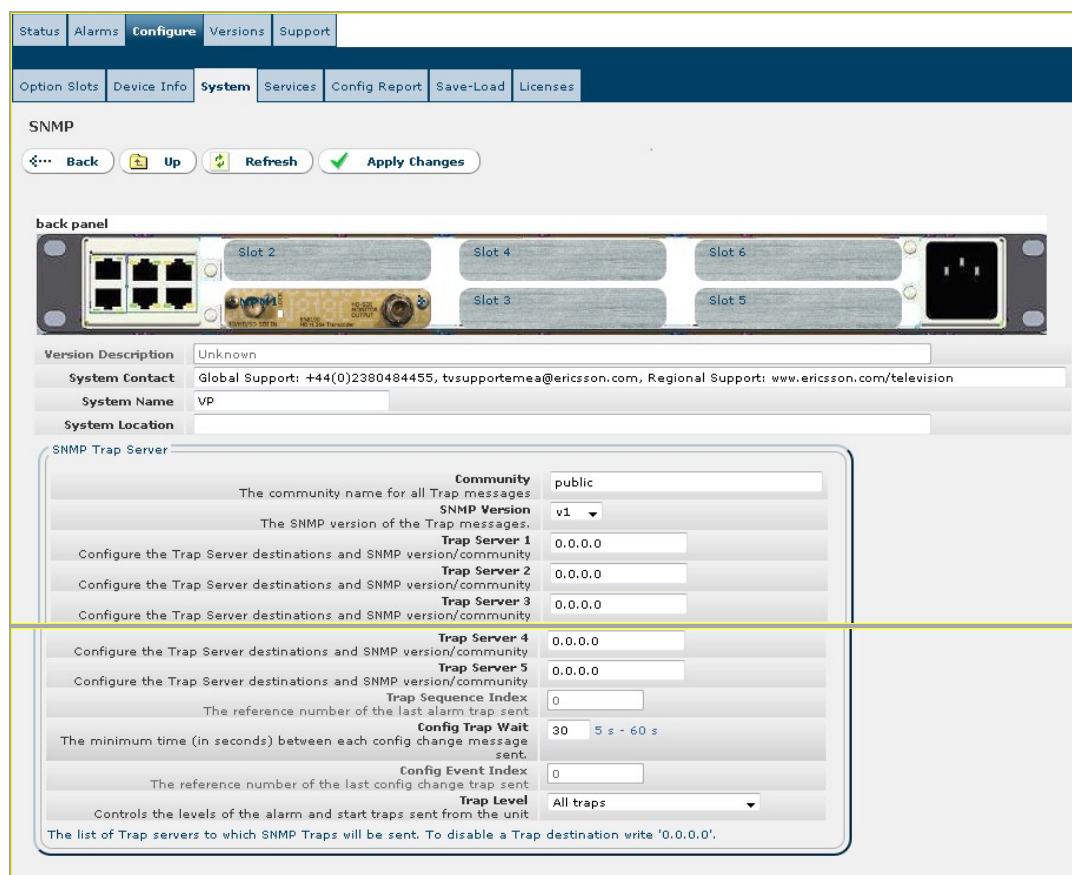


Figure 5.51 Configure > System > SNMP Web Page

The following fields are available from this web page:

- **Version Description** – Description of the current SNMP Version.
- **System Contact** – Contact details for the system manufacturer.
- **System Name** – Current system name.
- **System Location** – Current system location.

SNMP Trap Server Section

- **Community** – Community name for all trap messages.
- **SNMP Version** – The SNMP version of the trap messages.
- **Trap Server 1/2/3/4/5** – This field enables you to configure the trap server destinations and SNMP version/community.
- **Trap Sequence Index** – The reference number of the last alarm trap sent.

- **Config Trap Wait** – The minimum time (in seconds) between each config change message sent.
- **Config Event Index** – The reference number of the config change trap sent.
- **Trap Level** – Controls the levels of the alarm and start traps sent from the unit.

5.4.4 Configure > Services

This whole section (5.4.4.x) needs to be updated for the SPR1100. The screenshots are not quite the same as there are no “ABR” services on the SPR1100.

This web page is where most of the settings are to create and edit transcoded services. It is also where most of the encode parameters for video and audio are set. To view this page, select the **Services** tab from the top-level **Configure** tab.

When this web page is selected, it takes a few moments to update the screen with the current information. The messages, **Loading Schema** and **Loading Device Configuration** will be displayed.

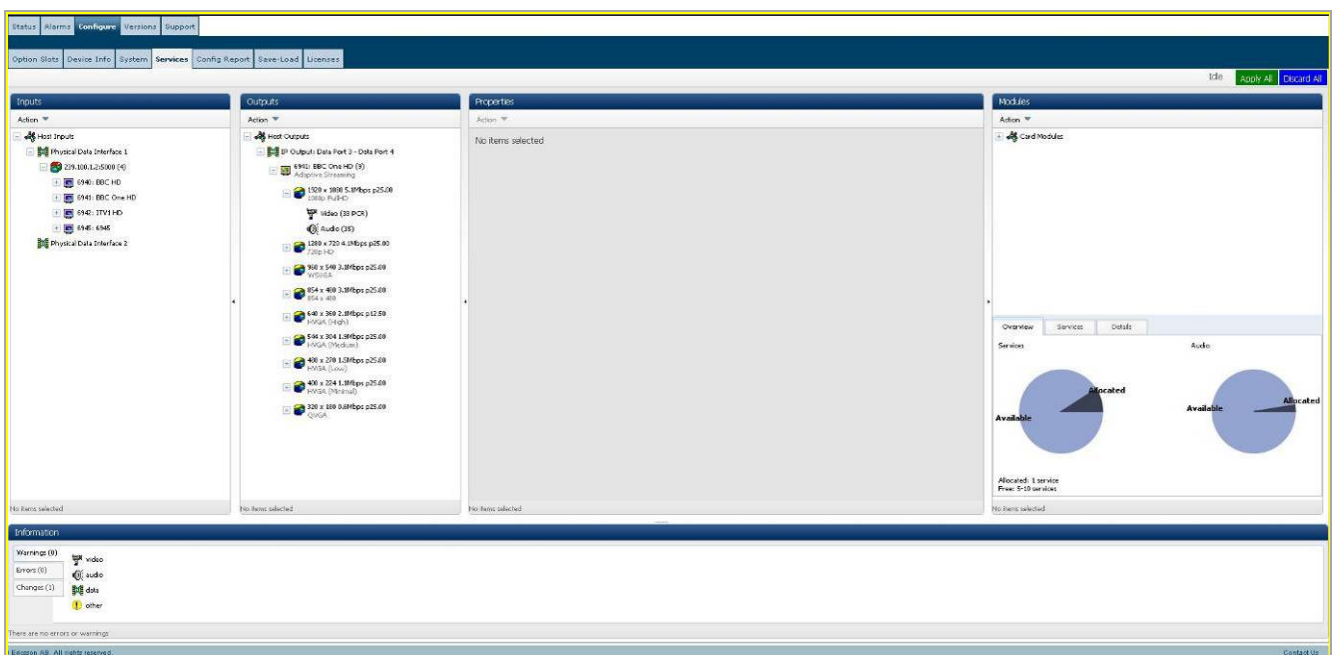


Figure 5.52 Configure > Services Web Page

The panels contained in this web page are described in the following sections.

5.4.4.1 Inputs Pane

The left-hand pane of the **Configure > Services** Web Page displays the input Transport Streams which the SPR1100 is set up to receive.



Figure 5.53 Input Pane

Transport Streams are grouped by Physical Interface. Each Transport Stream is defined by its IP address and port number. Multiple services can reside within each transport stream, with multiple components within each service.

The tree of input streams is navigated by expanding and contracting items using the + and – buttons alongside. All entries within an item can be expanded by right-clicking on that item and selecting **Expand All**.

Selecting an item (by clicking on it) causes the relevant properties for that item to be displayed in the **Properties** panel. Properties that cannot be edited will be greyed out.

Transport streams may be added to a Data Interface by right-clicking on the interface entry and selecting **Add transport stream**.

5.4.4.1.1 Input Pane Action Menu

The **Input** pane **Action** button provides menu options for managing the content of the **Input** pane. These options are also available on a context menu when you right-click on the **Input** pane.

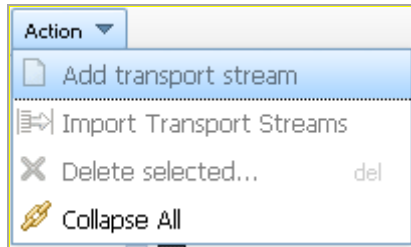


Figure 5.54 Input Pane Action Menu

- **Add transport stream** – Enables a new Transport Stream to be created and added to the Input Pane. Note that it can take several seconds for a transport stream to be recognized and its components displayed
- **Import Transport Streams** – Enables multiple Transport Streams to be imported to the Input Pane, see *Figure 5.61* on page 5-53 for details of this dialog.
- **Delete selected...** – Deletes the selected item from the Input Pane.
- **Collapse All** – Collapses all the expanded lists of Transport Streams in the Input Pane.

5.4.4.2 Outputs Pane

The second pane from the left defines the output services that will be produced by the unit.

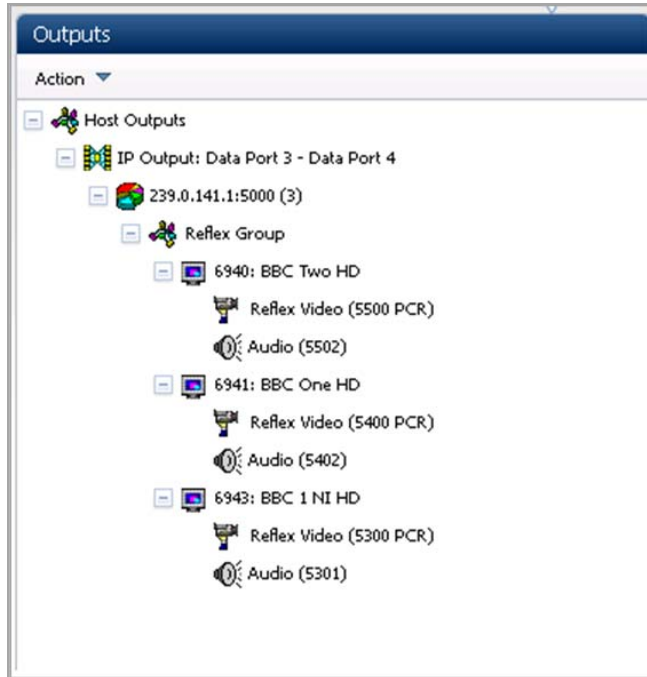


Figure 5.55 Outputs Pane

Output services are again grouped by Physical Interface.

Output services are created by dragging across an input service from the input pane and dropping on the IP Output Data Port.

Note: Each input service may be used more than once to produce multiple output services. This is achieved by dragging the same input service multiple times to the IP Output Data Port. The Output Services will not be exactly synchronized to each other. Each profile in each Output Service will require separate licenses.

5.4.4.2.1 Outputs Pane Action Menu

The **Outputs** pane **Action** button provides menu options for managing the content of the **Outputs** pane. These options are also available on a context menu when you right-click on the **Outputs** pane.

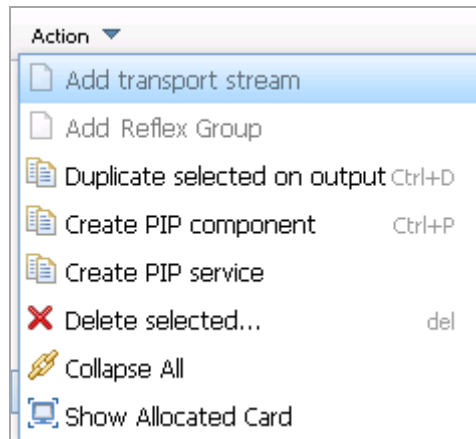


Figure 5.56 Output Pane Action Menu

- **Add transport stream** – Enables a new transport stream to be created and added to the output.
- **Add Reflex Group** – Enables a new Reflex Group to be created and added to the output.
- **Duplicate selected on output** – Enable the selected item to be duplicated on the output.
- **Create PIP component** – Enables a Picture-in-Picture component to be created for the output.
- **Create PIP service** – Enables a Picture-in-Picture service to be created for the output.
- **Delete selected...** – Deletes the selected item from the output.
- **Collapse All** – Collapses all the expanded lists of Transport Streams in the output.
- **Show Allocated Card** – Displays (highlights) the relevant Media Processing Module being used to transcode the selected item.

5.4.4.3

Properties Pane

The third pane from the left defines the properties of the items selected in the **Inputs** or **Outputs** panes. Only the relevant properties and sub-panes (accordions) are displayed, depending on the item selected. For each item selected, a number of panes will appear in the **Properties** pane. These include:

- Host Inputs
- Transport Stream
- Reflex Group
- Service
- Components

- Video Component

Note: If the video is within a Reflex Group, this pane will be called **Video Reflex Component**.

- Video PIP Component
- Audio Component.
- Duplicate Component

Note: Not all of these will be available for every component.

The **Properties** pane is grayed out if no inputs or outputs are selected. To activate the **Properties** pane to view and edit output parameters, select an item from the **Outputs** pane.

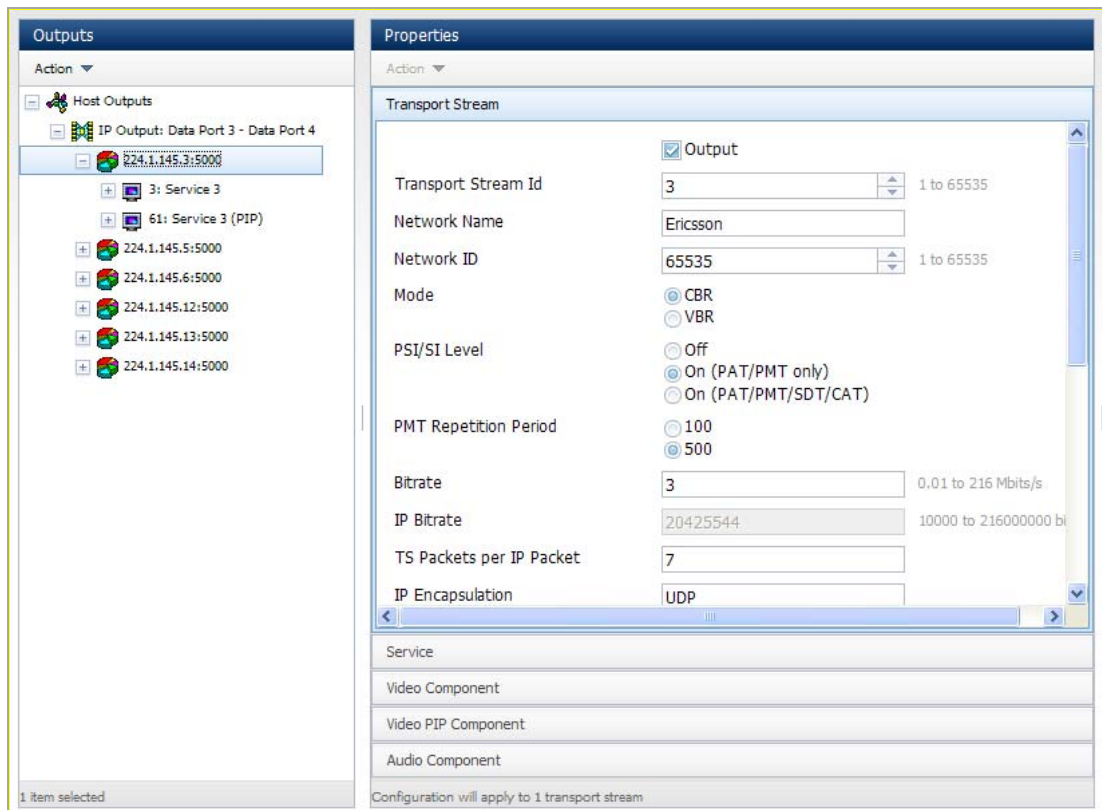


Figure 5.57 Item Properties According to Item Selected in Output Pane

Each pane of the configuration may have several sets of parameters that may be configured. These are arranged in a tabbed interface within the pane.

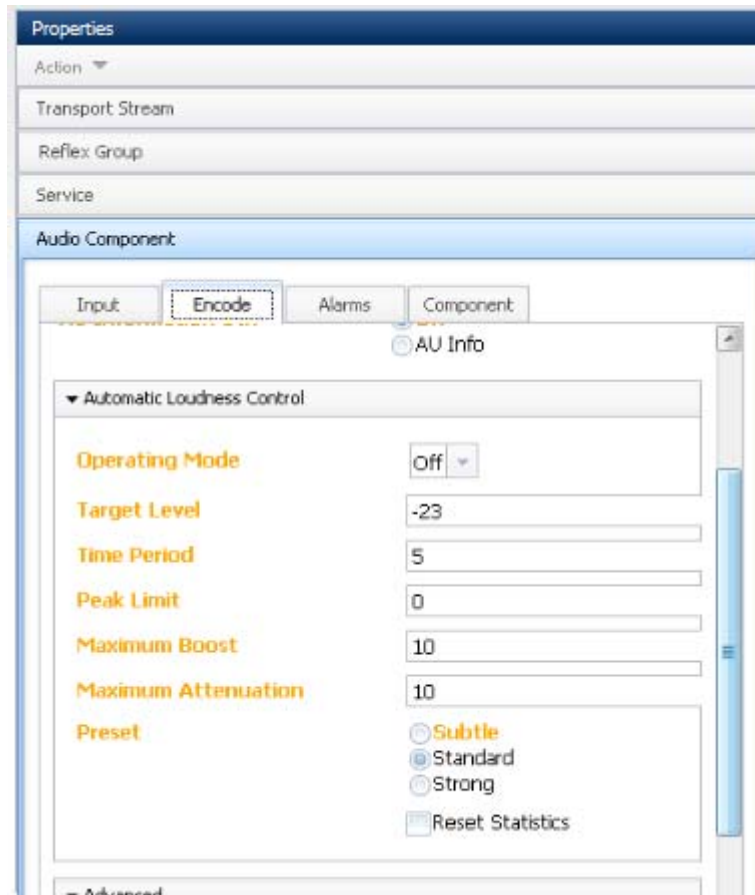


Figure 5.58 Properties Window Showing Tabbed Levels

5.4.4.3.1 Properties Action Menu

This menu is relevant only when a data interface is highlighted in the **Inputs** pane.

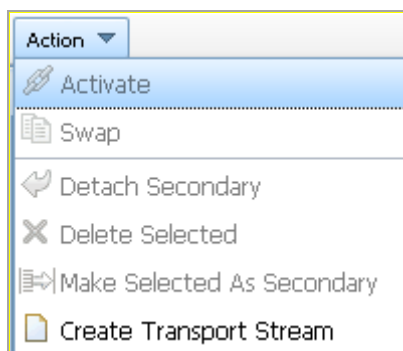


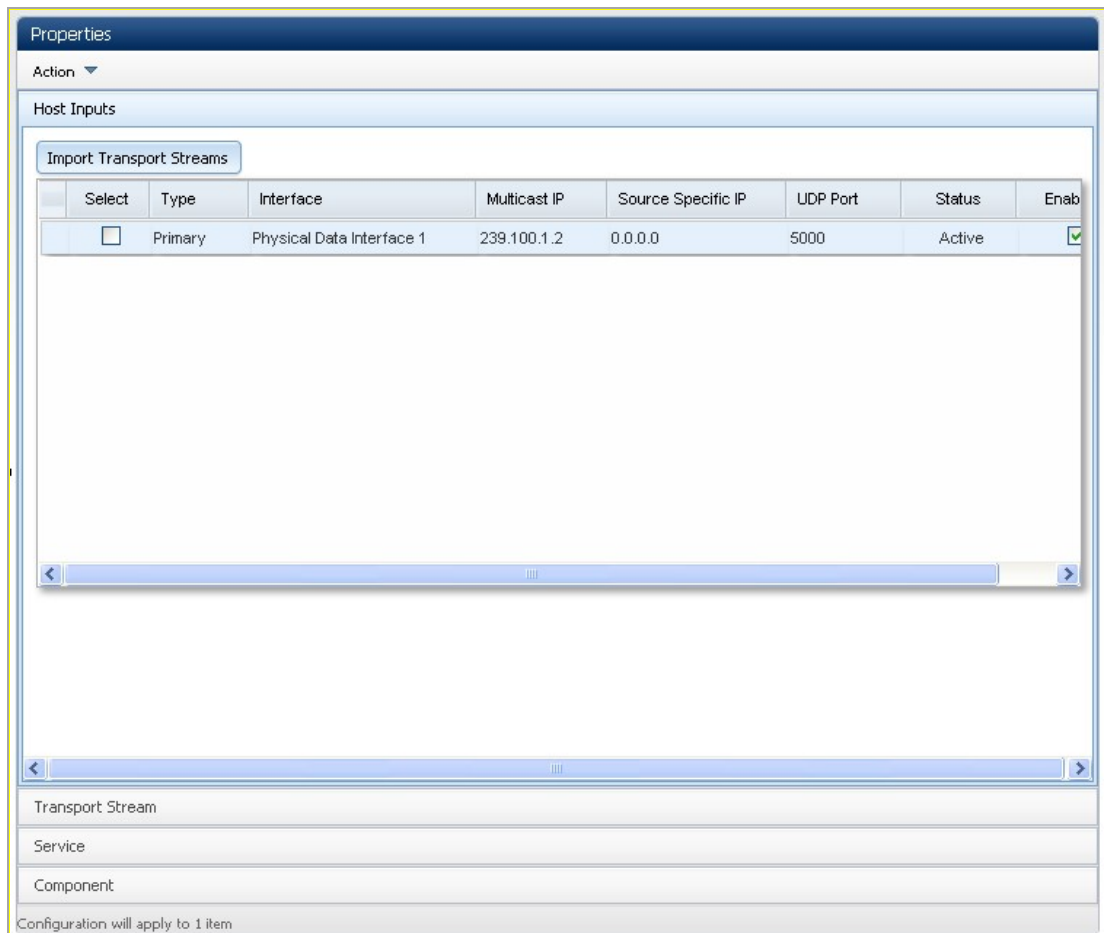
Figure 5.59 Properties > Action Menu (Input Selected)

- **Activate** – Forces the selected unit to be the active or Primary unit in a 1+1 Redundant system.
- **Swap** – Swaps over the Primary and Secondary units in a 1 + 1 Redundant system.
- **Detach Secondary** – Detaches the secondary unit.

- **Delete Selected** – Deletes the selected item.
- **Make Selected As Secondary** – Forces the selected unit to be the slave or Secondary unit in a 1+1 Redundant system.
- **Create Transport Stream** – Enables a new Transport Stream to be created and added to the Input Pane.

5.4.4.3.2 Properties > Host Inputs (Input)

The **Properties** pane is grayed out if no inputs or outputs are selected. To activate the **Properties** pane, to view and edit input parameters, select **Host Inputs** from the **Inputs** pane.



The screenshot shows the 'Properties' pane with the 'Host Inputs' accordion expanded. Inside the accordion, there is a button labeled 'Import Transport Streams' and a table with the following data:

Select	Type	Interface	Multicast IP	Source Specific IP	UDP Port	Status	Enab
<input type="checkbox"/>	Primary	Physical Data Interface 1	239.100.1.2	0.0.0.0	5000	Active	<input checked="" type="checkbox"/>

Below the table, there are two horizontal scroll bars. At the bottom of the pane, there are three tabs: 'Transport Stream', 'Service', and 'Component'. A status message at the very bottom reads 'Configuration will apply to 1 item'.

Figure 5.60 Properties > Host Inputs Accordion (Input Transport Stream)

The number of parameters on the **Host Inputs** accordion depends on the original item selected. This accordion displays information and status about the Transport Streams at the input. They can be enabled or disabled individually.

Import Transport Streams

The **Import Transport Streams** button enables multiple Transport Streams to be configured. See *Chapter 3, Getting Started* for how to import Transport Streams.

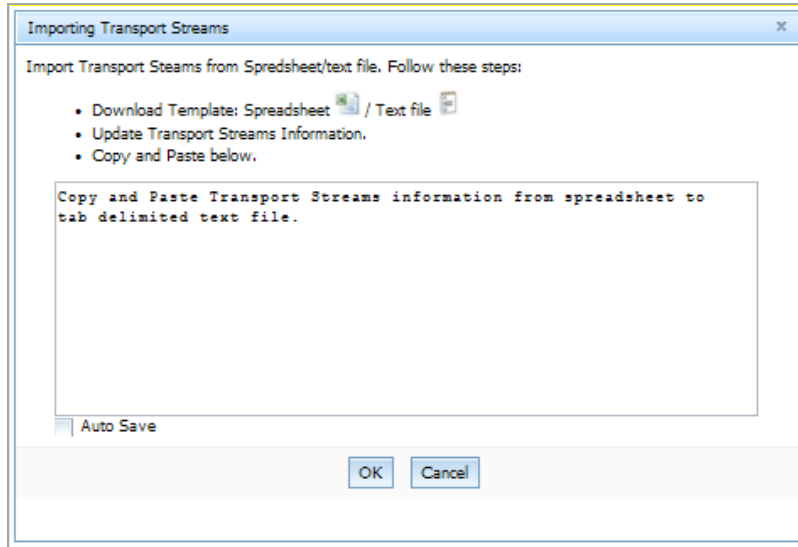


Figure 5.61 Import Transport Streams Pop-Up Window

5.4.4.3.3 Properties > Transport Stream (Output)

To see details of a Transport Stream in the **Outputs** pane, select the **Transport Stream** accordion from the **Properties** pane.

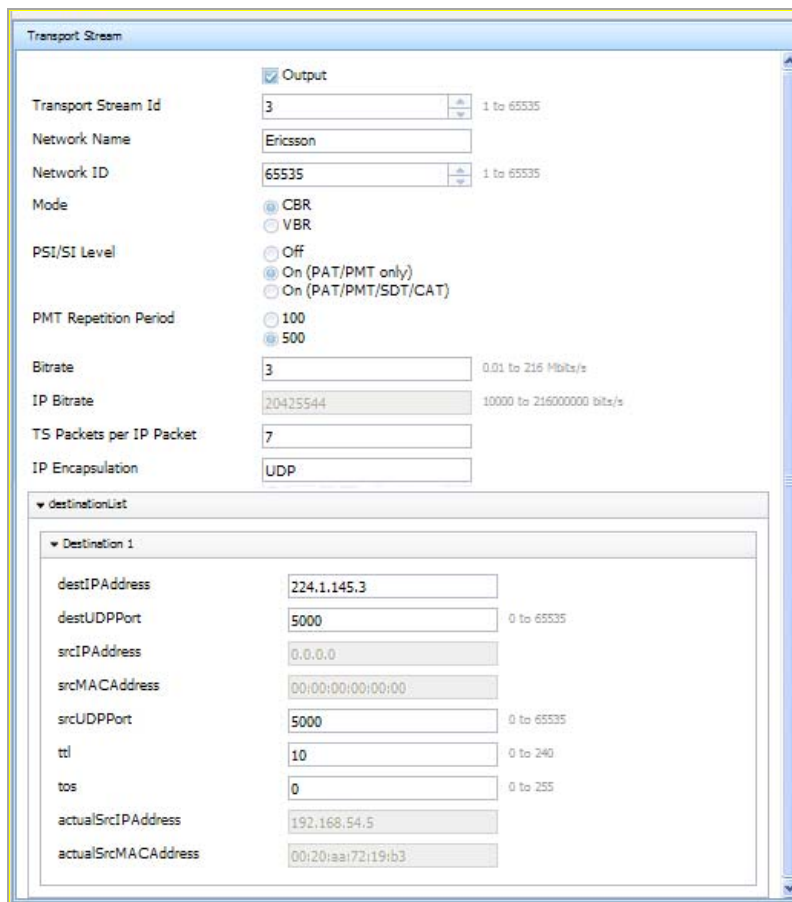


Figure 5.62 Properties > Transport Stream Accordion (Output Transport Stream)

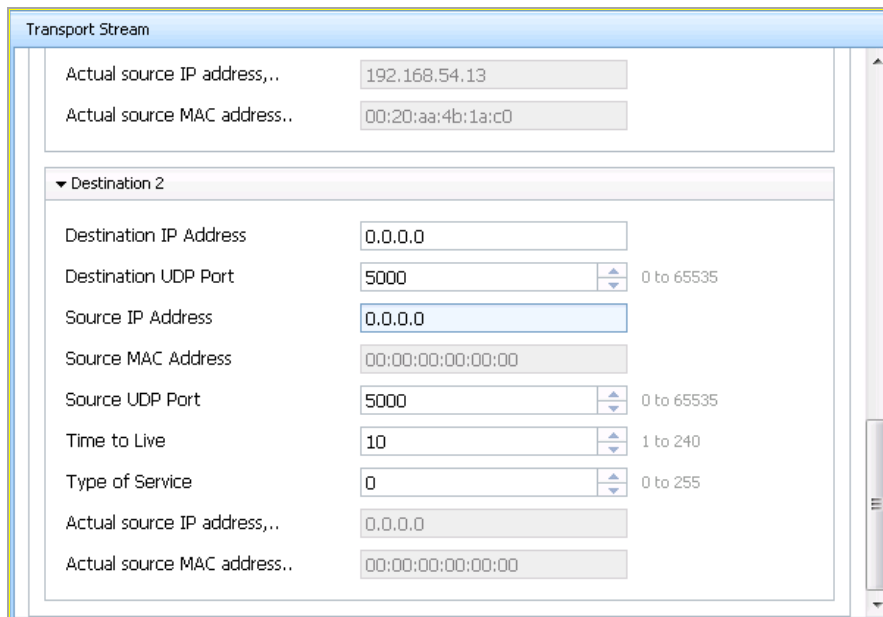
The following fields are available (not all of these parameters will always be present, nor will they all be user-editable):

- **Output** – Shows whether the stream is enabled in the output.
- **Transport Stream Id** – Displays the ID of the selected Input Transport Stream.
- **Network Name** – Network name for this stream.
- **Network ID** – Numeric ID for this network.
- **Mode** – Constant Bit Rate (CRB) or Variable Bit Rate (VBR) can be selected using these check-boxes.
- **PSI/SI Level** – Program Specific Information/System Information can be selected from the drop-down menu.
- **PMT Repetition Period** – Time between repetitions of PMT table, in ms. 100 or 500 can be selected.
- **Bit rate** – Required bit rate in the stream.
- **IP Bit rate** – Bit rate of the resulting IP stream.
- **TS Packets per IP Packet** - Number of Transport Stream packets in each IP packet.
- **IP Encapsulation** – Type of IP packet in use.

Destination 1/2

- **destIPAddress** – IP Destination address.
- **destUDPPort** – Destination port for IP stream.
- **srcIPAddresses** – Source IP address contained within outgoing packets.
- **srcMacAddress** – MAC address contained within outgoing packets.
- **srcUDPPort** – Source Port of outgoing packets.
- **ttl** – Time To Live value of outgoing packets.
- **tos** – Type of Service, as defined in RFC 2474.
- **actualSrcIPAddress** – Actual IP address of output interface.
- **actualSrcMACAddress** – Actual MAC address of output interface.
- **Enable Source** – This box may be checked to enable the input source.
- **Multicast IP Address** – Displays the multicast IP address.
- **Source Specific IP Address** – Displays the source specific IP address.
- **Source UDP Port** – Displays the source User Datagram Protocol port number.

Note: In **active-active, different network** mode (see section 5.4.3.2.3), you must set separate setting for the data 4 interface in **Destination 2**.



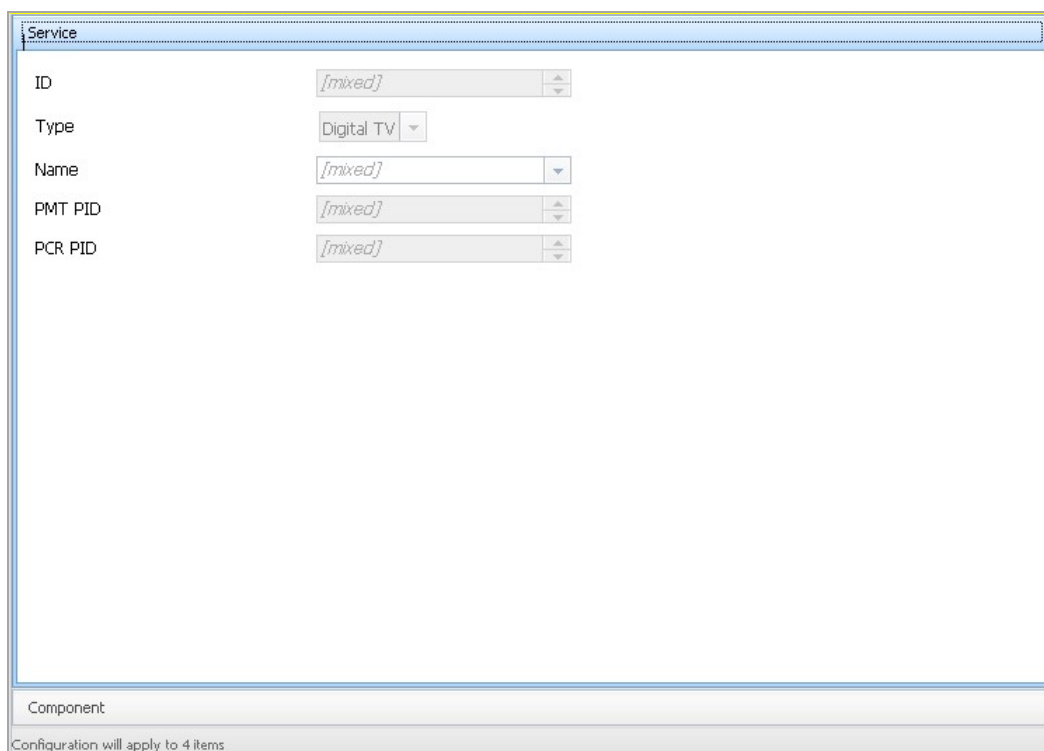
The screenshot shows the 'Transport Stream' configuration window. The 'Destination 2' section is expanded, showing the following fields:

Actual source IP address,..	192.168.54.13
Actual source MAC address..	00:20:aa:4b:1a:c0
▼ Destination 2	
Destination IP Address	0.0.0.0
Destination UDP Port	5000 (0 to 65535)
Source IP Address	0.0.0.0
Source MAC Address	00:00:00:00:00:00
Source UDP Port	5000 (0 to 65535)
Time to Live	10 (1 to 240)
Type of Service	0 (0 to 255)
Actual source IP address,..	0.0.0.0
Actual source MAC address..	00:00:00:00:00:00

Figure 5.63 Properties > Transport Stream Accordion > Destination 2

5.4.4.3.4 Properties > Service (Input)

To see the service parameters of input Transport Streams, select the **Service** accordion from the **Properties** pane.



The screenshot shows the 'Service' configuration window. The 'Service' accordion is expanded, showing the following fields:

ID	[mixed]
Type	Digital TV
Name	[mixed]
PMT PID	[mixed]
PCR PID	[mixed]

At the bottom, there is a 'Component' section and a note: 'Configuration will apply to 4 items'.

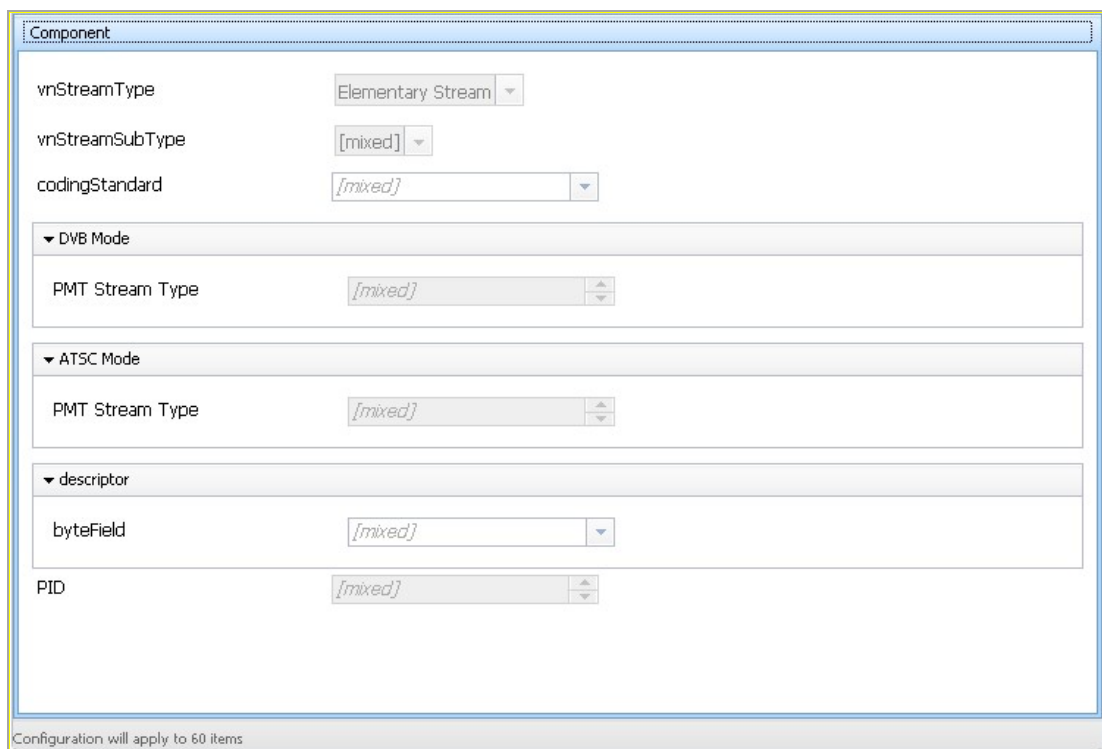
Figure 5.64 Properties > Service Accordion (Input Transport Stream)

The following fields are available (not all of these parameters will always be present, nor will they all be user-editable):

- **Provider** – The organization that created this service.
- **ID** – Displays the ID of the service.
- **Type** – Displays the type of service.
- **Name** – Displays the name of the service.
- **PMT PID** – The PID that holds the PMT describing this service.
- **PCR PID** – The PID that holds the PCR describing this service.
- **PSI/SI Level** – Grouping of services into channels within the Multicast.

5.4.4.3.5 Properties > Component (Input)

To view details of the individual components in an input transport stream, select the **Component** accordion from the **Properties** pane.



The screenshot shows the 'Component' accordion expanded. It contains the following fields:

- vnStreamType**: Elementary Stream (dropdown)
- vnStreamSubType**: [mixed] (dropdown)
- codingStandard**: [mixed] (dropdown)
- DVB Mode** (expanded):
 - PMT Stream Type**: [mixed] (dropdown)
- ATSC Mode** (expanded):
 - PMT Stream Type**: [mixed] (dropdown)
- descriptor** (expanded):
 - byteField**: [mixed] (dropdown)
- PID**: [mixed] (dropdown)

At the bottom, a status bar indicates: 'Configuration will apply to 60 items'.

Figure 5.65 Properties > Component Accordion (Input Transport Stream)

The following fields are available (not all of these parameters will always be present, nor will they all be user-editable):

- **vnStream Type** – Displays the type of vnStream.
- **vnStreamSub Type** – Displays the sub-type of vnStream.
- **Coding Standard** – Displays the Coding Standard.

DVB Mode

- **PMT Stream Type** – Displays the type of Program Map Table Stream in Digital Video Broadcast mode.

ATSC Mode

- **PMT Stream Type** – Displays the type of Program Map Table Stream in ATSC mode.

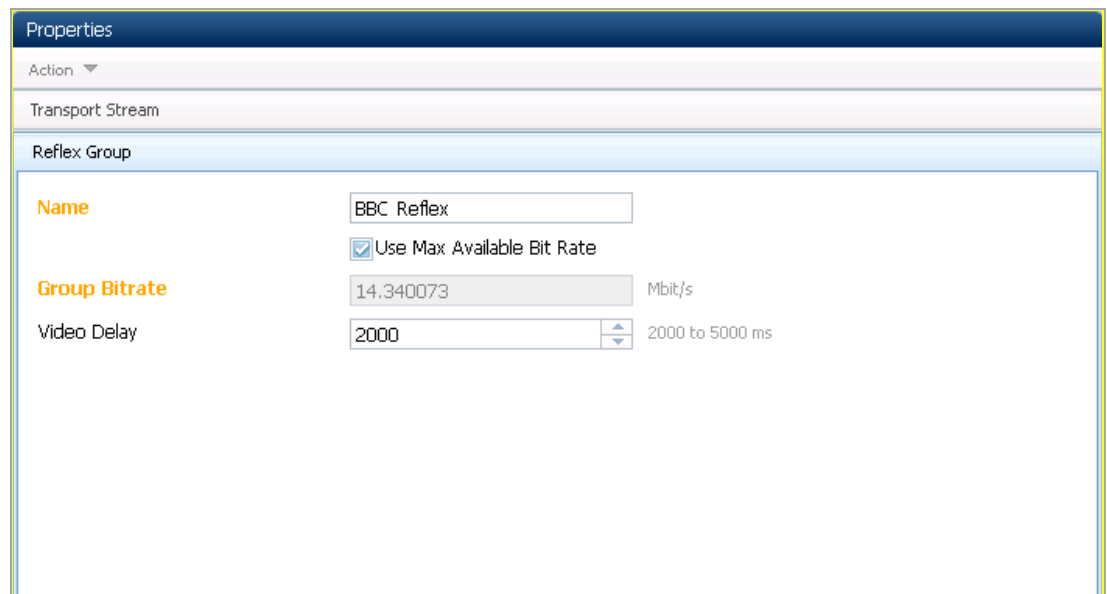
Descriptor

- **bytefield** – Displays the associated bytefield for the selected stream type.

5.4.4.3.6

Properties > Reflex Group (Output)

To see the service parameters of a Reflex Group, select the **Reflex Group** accordion from the **Properties** pane.



The screenshot shows a web interface with a 'Properties' pane. The 'Reflex Group' accordion is expanded, revealing several fields: 'Name' (BBC Reflex), 'Use Max Available Bit Rate' (checked), 'Group Bitrate' (14.340073 Mbit/s), and 'Video Delay' (2000 ms). The 'Video Delay' field has a range indicator '2000 to 5000 ms'.

Figure 5.66 Properties > Reflex Group Accordion (Output Transport Stream)

The following fields are available (not all of these parameters will always be present, nor will they all be user-editable):

- **Name** – User-definable name that appears on the output panel list.
- **Use max Available Bit Rate** – Checked by default. This maximizes the bit rate of the Reflex group to fill the entire Transport Stream (subject to a small overhead to ensure the Transport Stream bit rate is never exceeded). An allowance is made for PSI/SI tables and audio and data components so that the Reflex group will not exceed the Transport Stream rate. Pass-through component allowances:
 - data: 300 kbps
 - audio pass-through: 400 kbps

Un-checking this box allows you to set a specific group rate. If you know your pass-through components are higher than the above allowance, you should manually set a lower group rate.

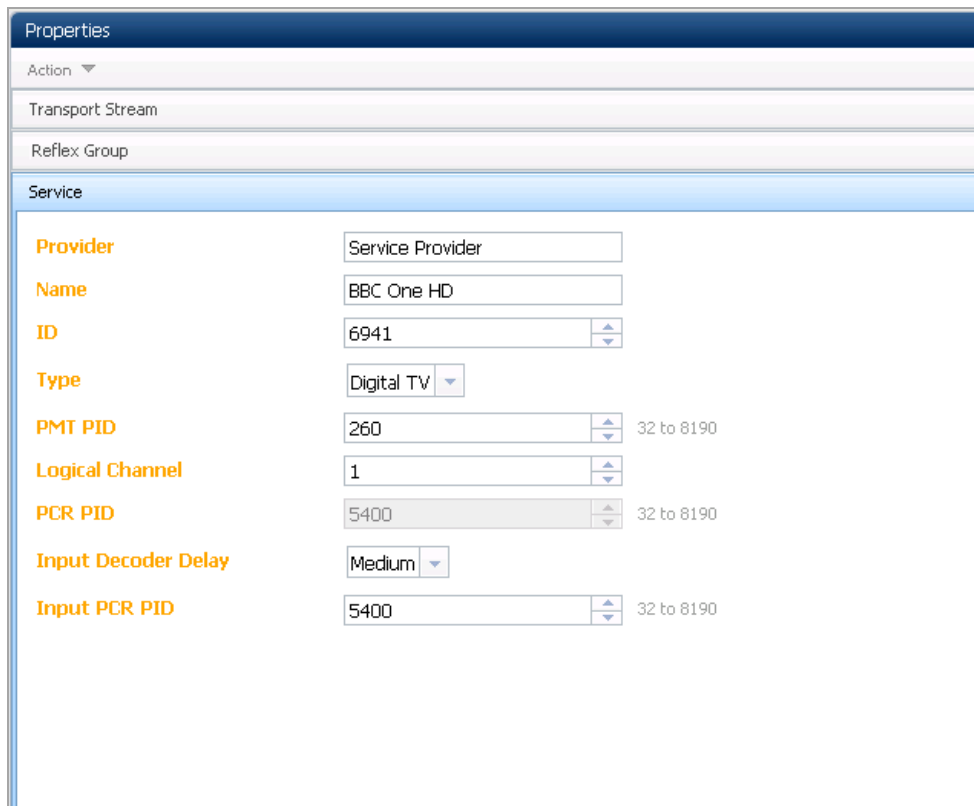
Note: If this box is unchecked and you set a Group Bit Rate manually, take care to ensure that there is enough headroom to accommodate all non-video components in the transport stream.

- **Group Bit Rate** – When the above **Use Max Available Bit Rate** box is unchecked, this field can be modified to set a specific group bit rate. When the **Use Max Available Bit Rate** box is checked, this field is not modifiable and is greyed-out, showing the bit rate that has been automatically set.
- **Video Delay** – Enables a specific video delay to be set. The range of delay that can be set depends on the output video format used (HD, SD, MPEG-2, H264). Allowing a longer delay will usually give better overall coding efficiency and thus better picture quality for a given group bit rate. The minimum bit rate (**Bmin**) that a video component will be allowed to drop to will depend on the delay setting and the output video format, so as to not violate the MPEG buffer models. **Bmin** will be calculated and set automatically.

5.4.4.3.7

Properties > Service (Output)

This pane shows the **Service** accordion with the **Service Properties** tab selected. The number of selectable accordions and the range of parameters within those accordions is dependent on the item selected in the **Outputs** pane.



The screenshot shows a web interface with a 'Properties' tab selected. Below it, there are three accordions: 'Action', 'Transport Stream', and 'Reflex Group'. The 'Service' accordion is expanded, showing the following parameters:

Parameter	Value	Range
Provider	Service Provider	
Name	BBC One HD	
ID	6941	
Type	Digital TV	
PMT PID	260	32 to 8190
Logical Channel	1	
PCR PID	5400	32 to 8190
Input Decoder Delay	Medium	
Input PCR PID	5400	32 to 8190

Figure 5.67 Properties > Service Accordion (Output Transport Stream)

The following fields are available (not all of these parameters will always be present, nor will they all be user-editable):

- **Provider** – The organization that created this service.
- **Name** – The name of the service.
- **ID** – Unique service ID in PMT.
- **Type** – Type of service.
- **PMT PID** – Program Map Table packet identifier.
- **Logical Channel** – Logical Channel number in PMT.
- **PCR PID** – Program Clock Reference packet identifier.
- **Input Decoder Delay** – Input decoder delay.
- **Input PCR PID** – Logical Channel number in PMT.

5.4.4.3.8 **Properties > Video Component (Output)**

To view and edit video component properties, select the **Video Component** accordion from the **Properties** pane.

The Video Component Properties pane may display upto five tabbed panes: **Input**, **Format Conversion**, **Encode**, **Output** and **Component**.

Properties > Video Component > Input

To view and edit the input properties, select the **Input** tab from the **Video Component** accordion.

The Ericsson SPR1100 will attempt to detect the input Video format according to the PSI table information in the input stream. If this is not available, or if the operator wishes to override the auto-detected setting, this screen will allow manual configuration of the video type.

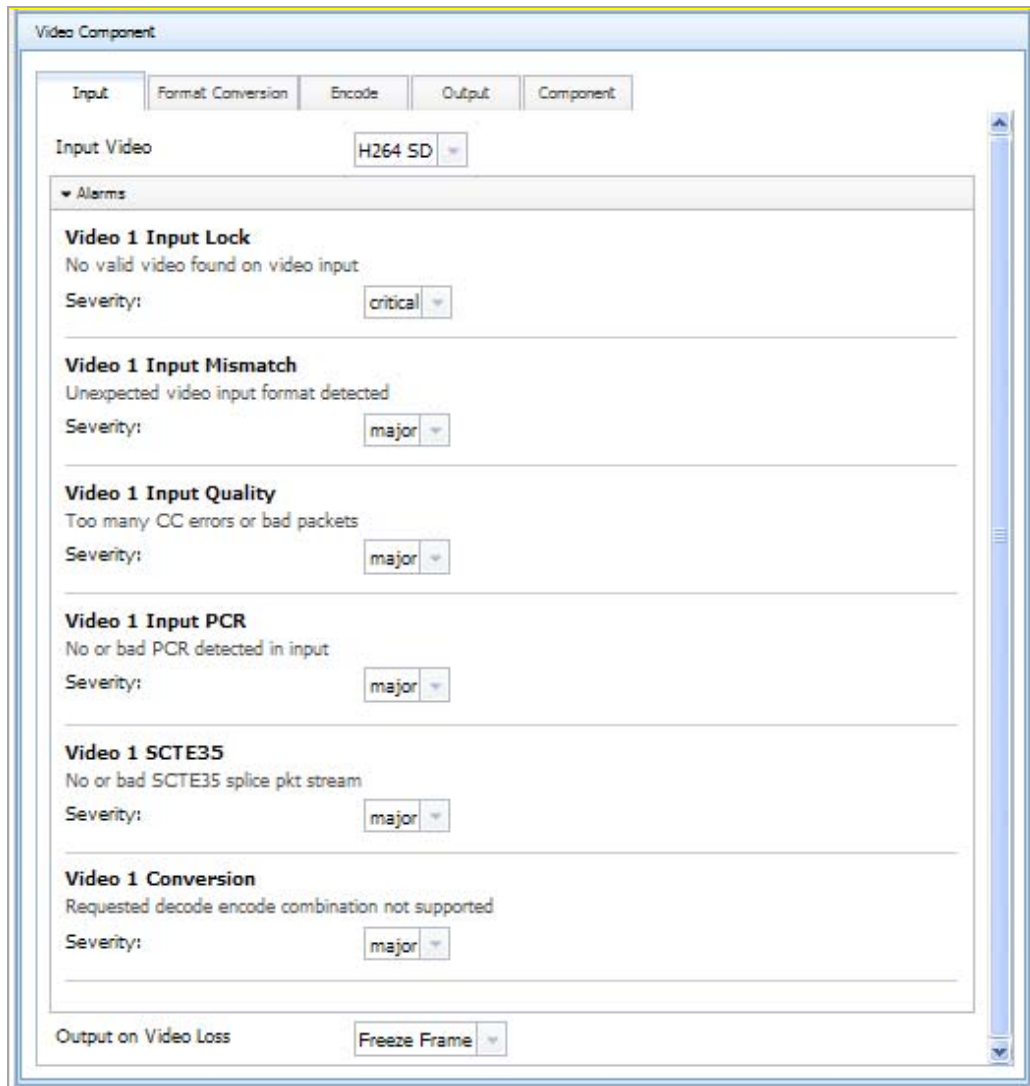
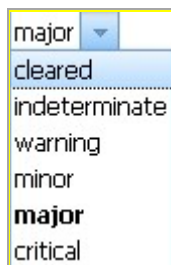


Figure 5.68 Properties > Video Component > Input Tab

The following fields are available:

- **Video X Alarms** – This pane details video related alarms and allow the user to determine the severity of these alarms by means of the drop-down menu:



- **Output on Video Loss** – Selects the feature to be displayed if the video signal is lost.

Properties > Video Component > Format Conversion

To view and edit the format conversion properties, select the **Format Conversion** tab from the **Video Component** accordion.

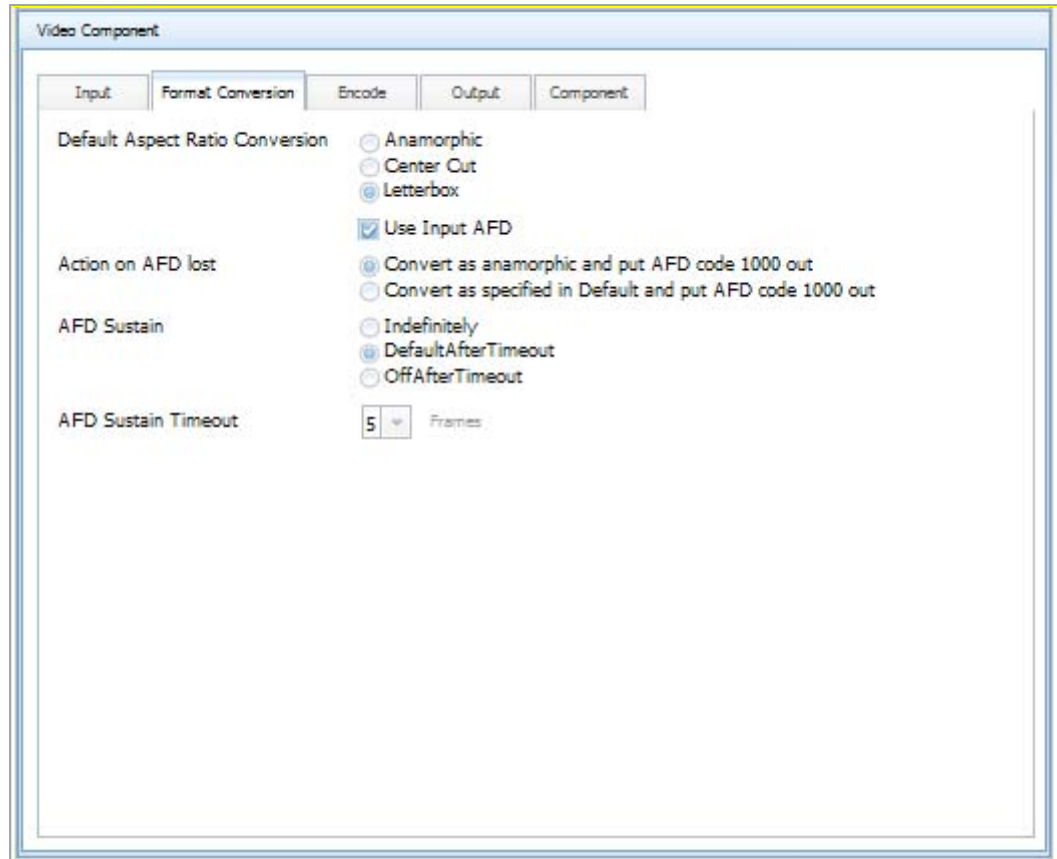


Figure 5.69 Properties > Video Component > Format Conversion Tab

The following fields are displayed on this pane (not all of these parameters will always be present, nor will they all be user-editable):

- **Default Aspect Ratio Conversion** – The default aspect ratio of the output video if AFD is not available on the input stream or if the "Use Input AFD" checkbox is not selected..
- **Action on AFD lost** – Action to be taken in the event that AFD is lost.
- **AFD Sustain** – The behavior of AFD on the output if AFD on the input is lost.
- **AFD Sustain Timeout** – How long to maintain AFD on the output if **Off After Timeout** is selected in the **AFD Sustain** parameter.

Properties > Video Component > Encode

To view and edit video component encode properties, select the **Encode** tab from the **Video Component** accordion.

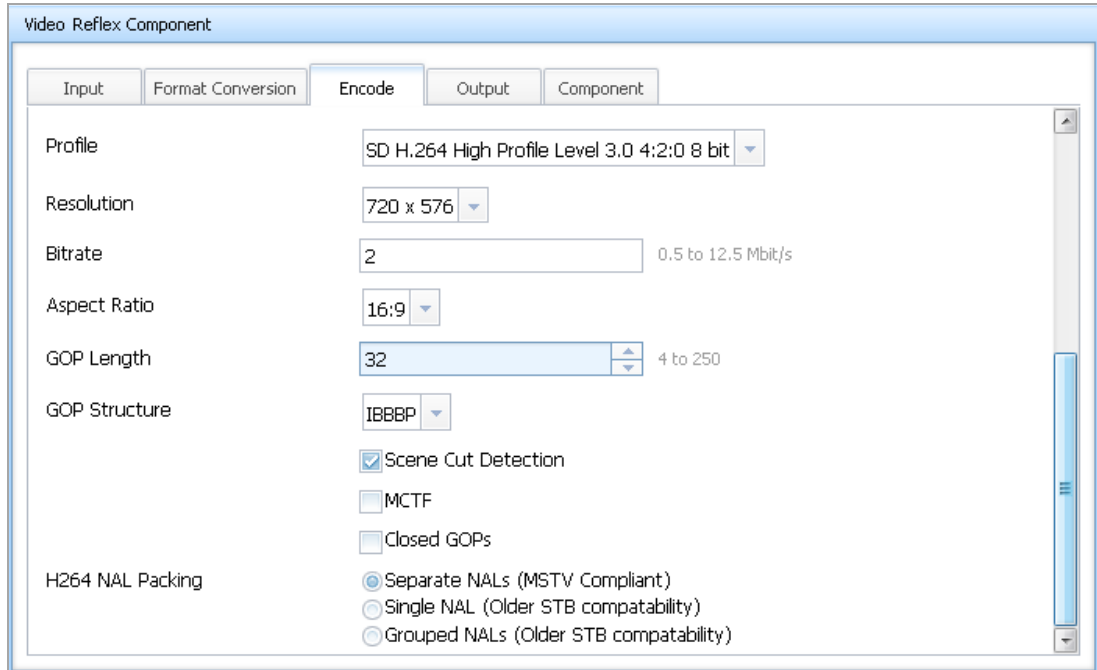


Figure 5.70 Properties > Video Component > Encode Tab (Reflex)

The following fields are available (not all of these parameters will always be present, nor will they all be user-editable):

- **Profile** – Profile / Level of encoding format to be used.
- **Resolution** – Required output resolution.
- **Bit rate** – Bit rate of output stream to be used for this component. For components within a Reflex group, this setting has no affect. If the component is moved to be outside of a Reflex group however, this bit rate will then be used.
- **Target Quality** – Desired output quality as a percentage.
- **Aspect Ratio** – Force output aspect ratio, or follow input ratio.
- **GOP Length** - Number of frames in each GOP.
- **GOP Structure** – Type of GOP.
- **Scene Cut Detection** – Detect Scene Cuts. This should normally be selected to improve picture quality across scene changes.
- **MCTF** – Enable Motion-Compensated Temporal Filtering.
- **Closed GOPs** – Ensure that GOPs have no external references.
- **H.264 NAL Packing** – Network Abstraction Layer (NAL) packing options:
 - Separate NALs (MSTV Compliant)
 - Single NAL (Older STB compatibility)
 - Grouped NALs (Older STB compatibility)

Properties > Video Component > Output

To view and edit the video component output properties, select the **Output** tab from the **Video Component** accordion.

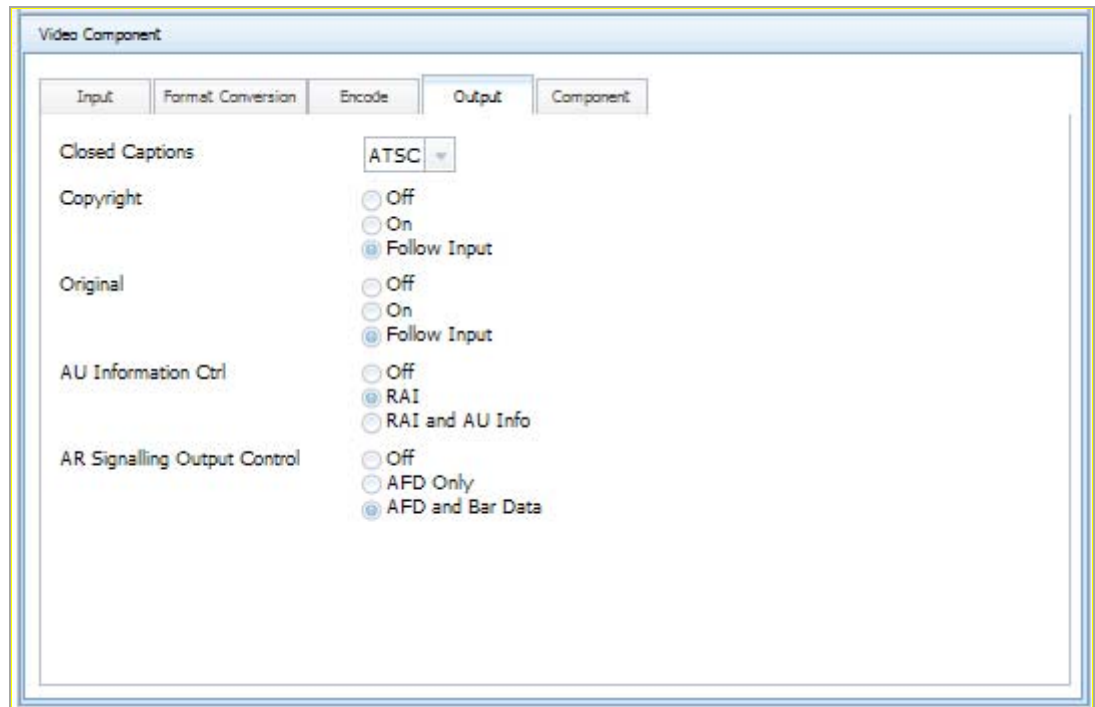


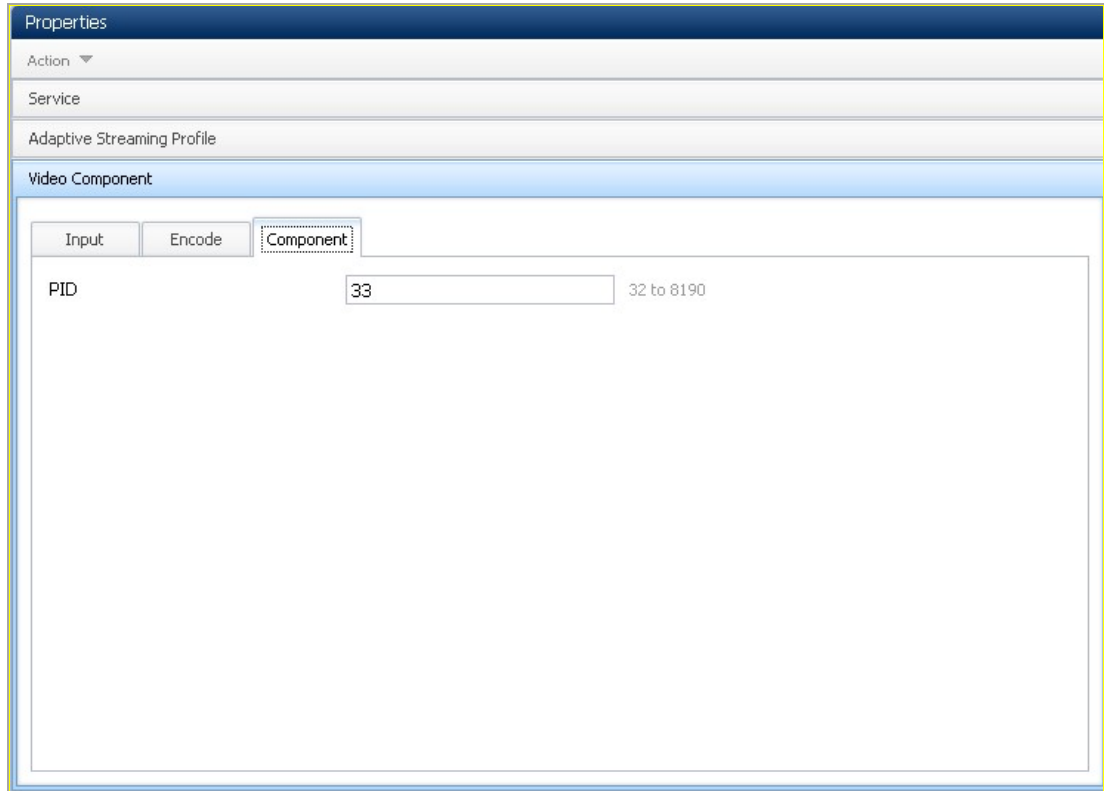
Figure 5.71 Properties > Video Component > Output Tab

The following fields are available (not all of these parameters will always be present, nor will they all be user-editable):

- **Closed Captions** – Type of Closed Caption data to be included.
- **Copyright** – Behavior of Copyright flag in the output stream.
- **Original** – Behavior of Original flag in the output stream
- **AU Information Control** – Enables additional information to be placed in the Adaptation Field for "Trick Mode".
- **AR Signaling Output Control**- Number of frames in each GOP.

Properties > Video Component > Component

To view and edit the video PID, select the **Component** tab from the **Video Component** accordion.



The screenshot shows a web interface for configuring video components. The 'Properties' window is open, showing the 'Video Component' section. Within this section, the 'Component' tab is selected. It displays a single configuration field for 'PID' with a value of '33' and a range of '32 to 8190'.

Figure 5.72 Properties > Video Component > Component Pane

There is only one field available:

- **PID** – Packet identifier of the Video Component in the output Transport Stream.

5.4.4.3.9 Properties > Video Reflex Component

The details of the tabs are as for the **Video Component** accordion, described above.

5.4.4.3.10 Properties > Audio Component

The Audio Component Properties accordion has four tabbed panes: **Input**, **Encode**, **Alarms** and **Component**.

Properties > Audio Component > Input

The **Input** tab permits the user to set the input standard, the pass-through/transcode mode, and the downmix type of the audio input. It also displays the status of the current audio input.

The Input format will be auto-detected by the unit, but the operator may over-ride that detection here if required.

To view and edit the input settings, select the **Input** tab from the **Audio Component** accordion.

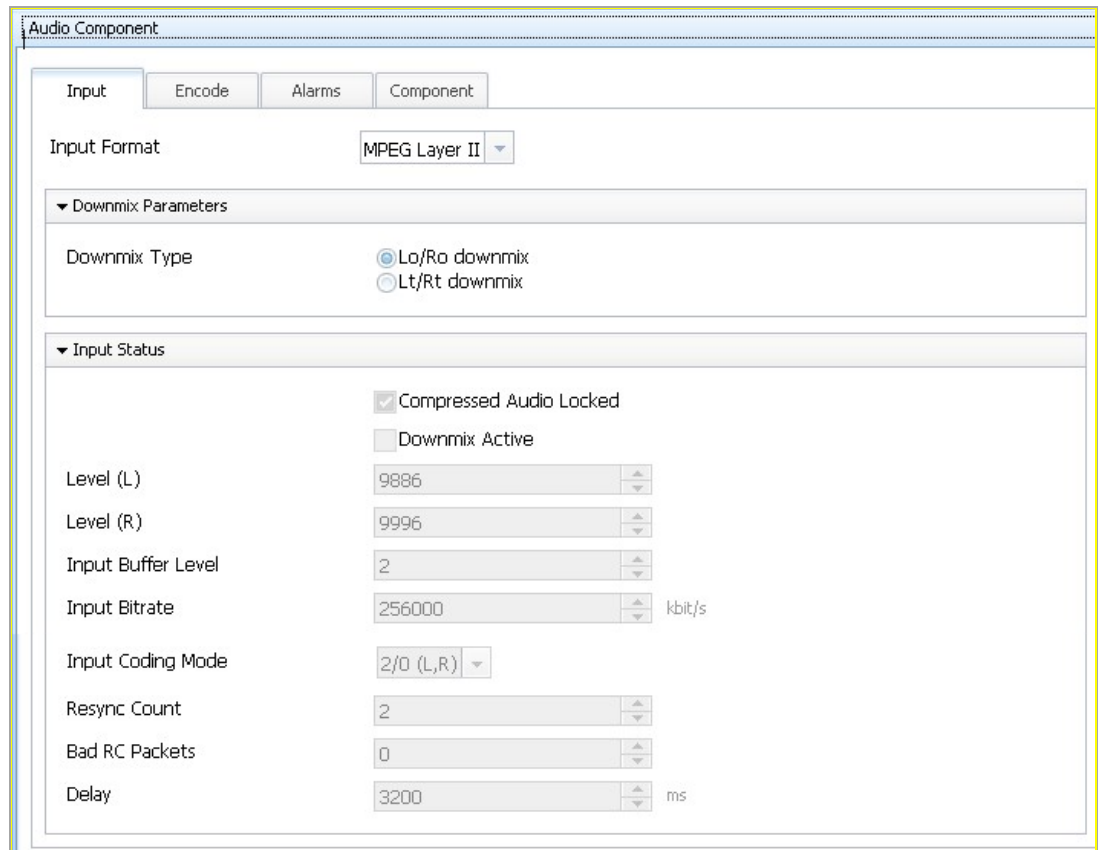


Figure 5.73 Properties > Audio Component > Input Tab

The following fields are available:

- **Input Format**– Name of the currently selected input format.

Downmix Parameters

- **Downmix Type** – Only relevant for Dolby input streams. Specifies how to downmix from 5.1 to 2.0. Refer to Dolby documentation for more information

Input Status

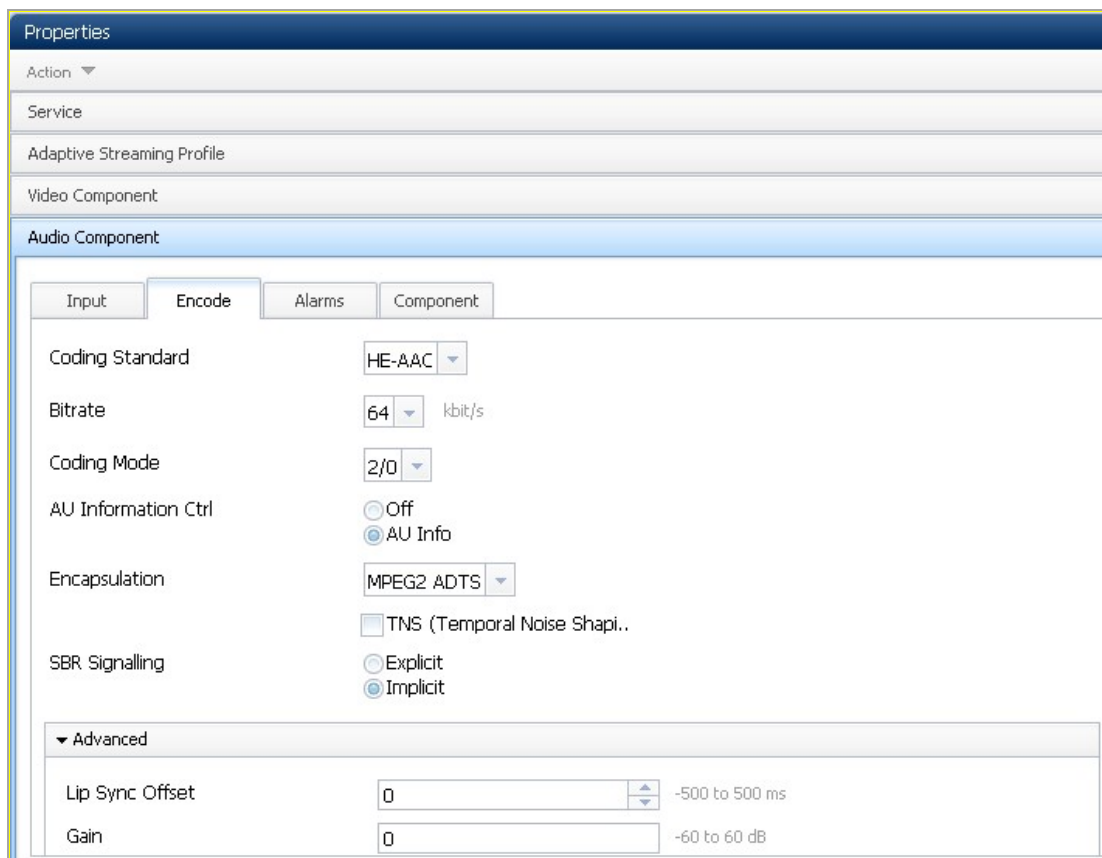
- **Compressed Audio Locked.**
- **Downmix Active** – Check this box to activate downmix.
- **Level Left (L)** – Left audio level.
- **Level Left (R)** – Right audio level.
- **Input Buffer Level** – Internal status information only.
- **Input Bit rate** – The detected input bit rate.
- **Input Coding Mode** – The detected input coding mode.
- **Resync Count** – Internal status information only.

- **Bad RC Packets** – Internal status information only.
- **Delay** – Shows the current delay through the unit.

Properties > Audio Component > Encode

The **Encode** tab permits the user to set various parameters controlling the audio encoding.

To display the encoding settings, select the **Encode** tab from the **Audio Component** accordion.



The screenshot shows the 'Properties' window with the 'Audio Component' accordion expanded and the 'Encode' tab selected. The 'Input' tab is also visible. The 'Encode' tab contains the following settings:

- Coding Standard:** HE-AAC (dropdown)
- Bitrate:** 64 (dropdown) kbit/s
- Coding Mode:** 2/D (dropdown)
- AU Information Ctrl:** ☐ Off, ☒ AU Info
- Encapsulation:** MPEG2 ADTS (dropdown)
- TNS (Temporal Noise Shapi..):** ☐
- SBR Signalling:** ☐ Explicit, ☒ Implicit

Below these settings is an 'Advanced' section with two parameters:

- Lip Sync Offset:** 0 (input field) with a range of -500 to 500 ms.
- Gain:** 0 (input field) with a range of -60 to 60 dB.

Figure 5.74 Properties > Audio Component > Encode Tab

The following Coding Standard options are available:

- **MPEG Layer II** – MPEG Layer II encode. Requires one SPR/SWO/AUD/MP2 license for each stereo pair to be encoded.
- **Dolby Digital** – Dolby Digital encode. Requires one SPR/SWO/AUD/AC3 license for each stereo pair to be encoded. Three licenses are required for 5.1 encoding.
- **AAC LC** – Low complexity AAC encode. Requires one SPR/SWO/AUD/AAC license for each stereo pair to be encoded. Three licenses are required for 5.1 encoding.



- **HE-AAC** – High efficiency AAC encode (AAC with Spectral Band Replication). Requires one SPR/SWO/AUD/AAC license for each stereo pair to be encoded. Three licenses are required for 5.1 encoding

The following further fields are available (not all of these parameters will always be present, nor will they all be user-editable):

- **Bit rate** – Bit rate of output audio stream.
- **Coding Mode** – Output channel mode selection (mono, stereo, or 5.1 as appropriate to the Coding Standard in use).
- **AU Information Ctrl** – Enable embedding PTS in the Adaptation Field for **Trick Mode**.
- **Encapsulation** – Container Format used for AAC.
- **TNS (Temporal Noise Shaping)** – Enable/disable AAC TNS tool.
- **SBR Signaling** – Method of signaling Spectral Band Replication.

Advanced

- **Lip Sync Offset** – Timing advance/retard to correct audio/video synchronization.
- **Gain** – Allows a manual gain correction between +/- 6 dB (in 0.1 dB steps) to be applied to the audio output.
- **MPEG Version** – Sets whether MPEG-1 or MPEG-2 stream type is signaled in the PMT.
- **Language** – Sets the language signaled in the PMT descriptor.

Automatic Loudness Control

Automatic Loudness Control (ALC) is a feature available with a SPR/SWO/ALC/C (charged) or SPR/SWO/ALC/F (free) license.

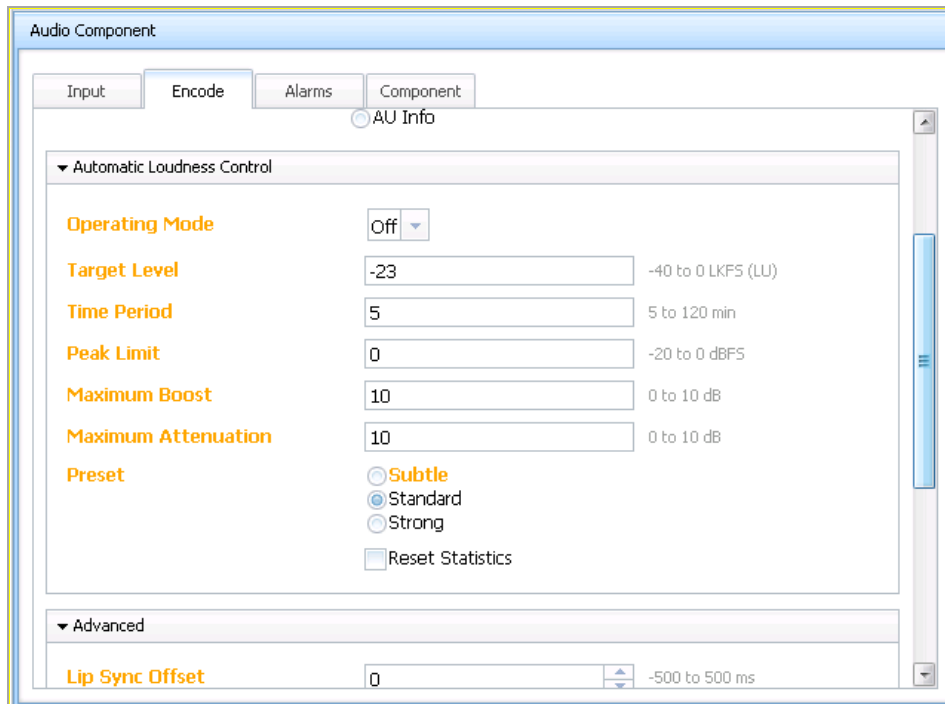


Figure 5.75 Properties > Audio Component > Encode Tab > Automatic Loudness Control

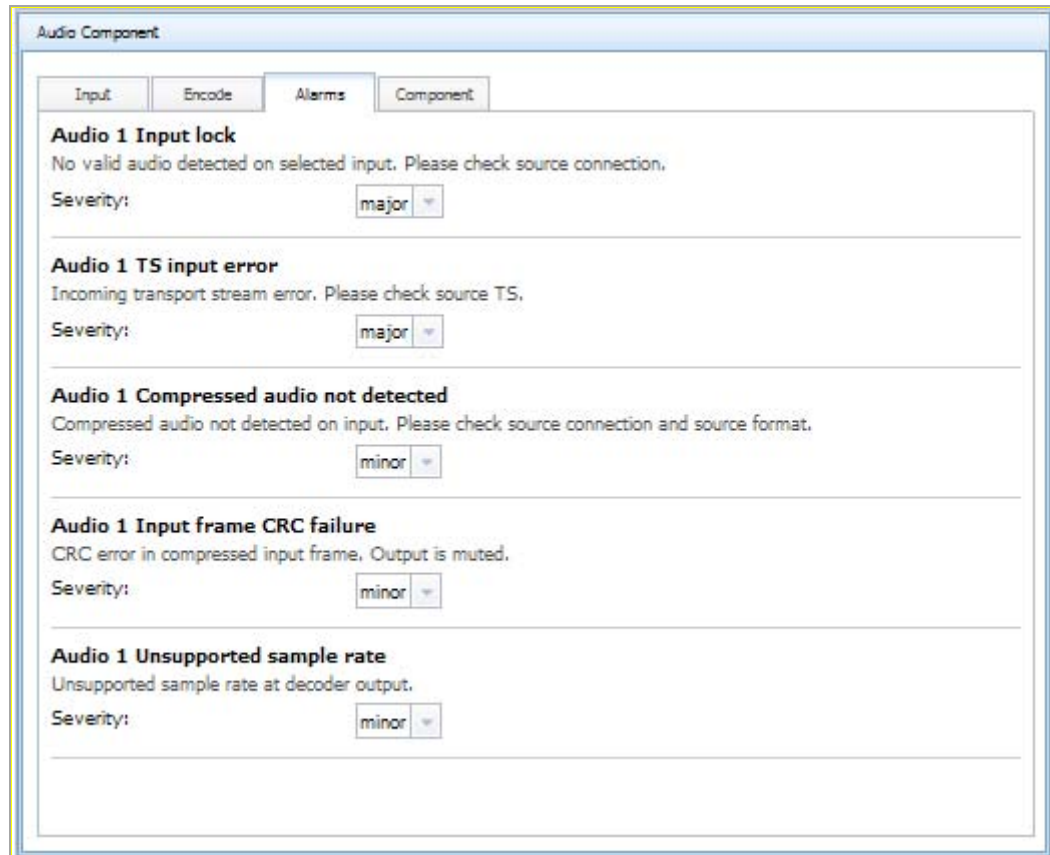
The following fields are displayed:

- **Operating Mode** – The operating mode.
- **Target Level** – Enables a target level in Loudness Units (LU) to be set.
- **Time Period** – Enables a time period to be set.
- **Peak Limit** – Enables a peak limit (in dBFS) to be set.
- **Maximum Boost** – Enables a maximum boost (in dB) to be set.
- **Maximum Attenuation** – Enables a maximum attenuation level (in dB) to be set.
- **Preset** – Enables preset options to be set:
 - Subtle
 - Standard
 - Strong
 - Reset Statistics

Properties > Audio Component > Alarms

The **Alarms** tab permits the user to set the severity of any audio alarm conditions.

To display the alarm settings, select the **Alarms** tab from the **Audio Component** accordion.

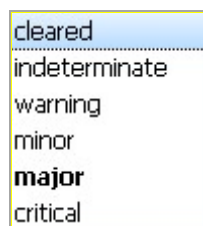


The screenshot shows the 'Audio Component' window with the 'Alarms' tab selected. It contains five alarm settings:

- Audio 1 Input lock**: No valid audio detected on selected input. Please check source connection. Severity: **major**
- Audio 1 TS input error**: Incoming transport stream error. Please check source TS. Severity: **major**
- Audio 1 Compressed audio not detected**: Compressed audio not detected on input. Please check source connection and source format. Severity: **minor**
- Audio 1 Input frame CRC failure**: CRC error in compressed input frame. Output is muted. Severity: **minor**
- Audio 1 Unsupported sample rate**: Unsupported sample rate at decoder output. Severity: **minor**

Figure 5.76 Properties > Audio Component > Alarms Tab

This tab enables you to set the severity of a number of audio component alarms using the drop-down menu displayed below.



The dropdown menu shows the following options:

- cleared
- indeterminate
- warning
- minor
- major**
- critical

Properties > Audio Component > Component

The **Component** tab permits the user to set the PID of the audio component.

To display the component settings, select the **Component** tab from the **Audio Component** accordion.

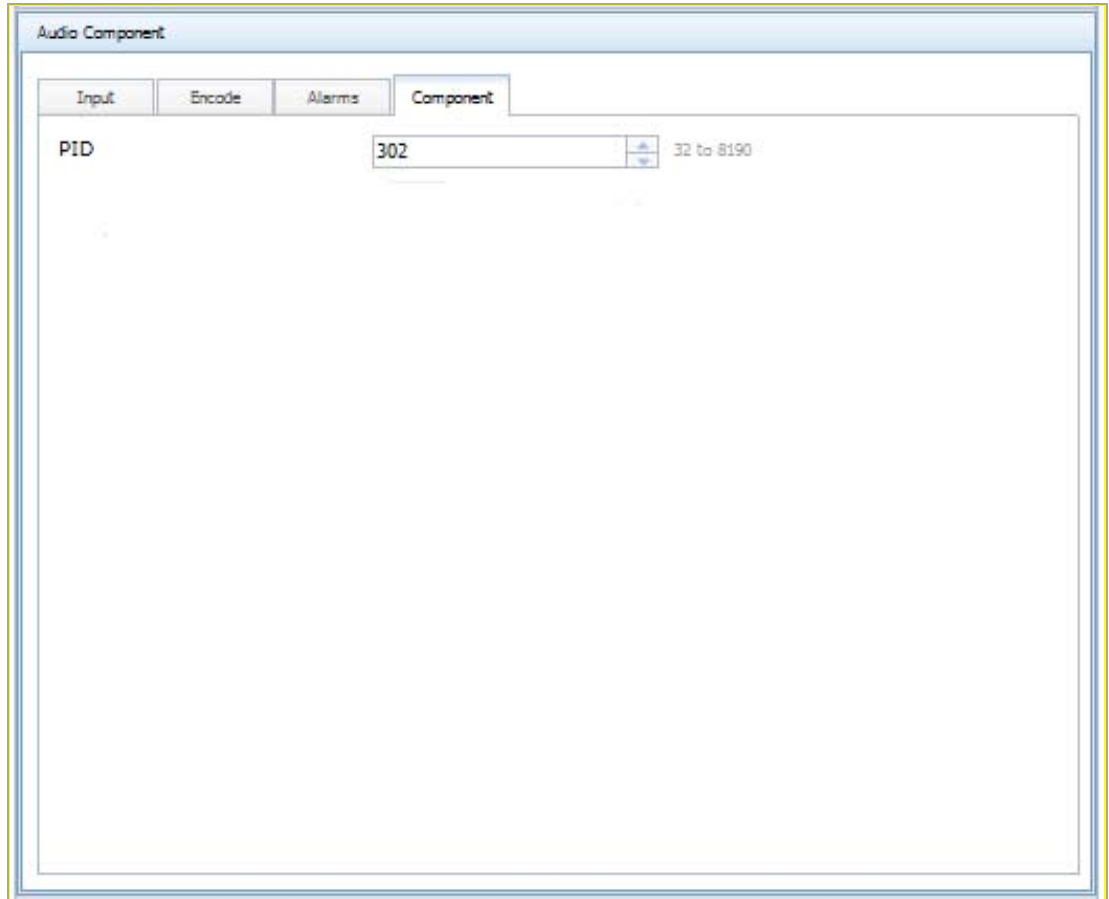


Figure 5.77 Properties > Audio Component > Component Tab

The following field is displayed:

- **PID** – PID of the audio Component in the output Transport Stream.

5.4.4.3.11 Properties > Duplicate Component

The Duplicate Component accordion indicates that this component has already been encoded elsewhere and is duplicated into this output profile. To change setting of a duplicated component you will need to follow the link to find the main instance where it is encoded.

Note: A change to these settings will affect all duplicated components.

To display the Duplicate Component properties, select the **Duplicate Component** accordion from the **Properties** pane.

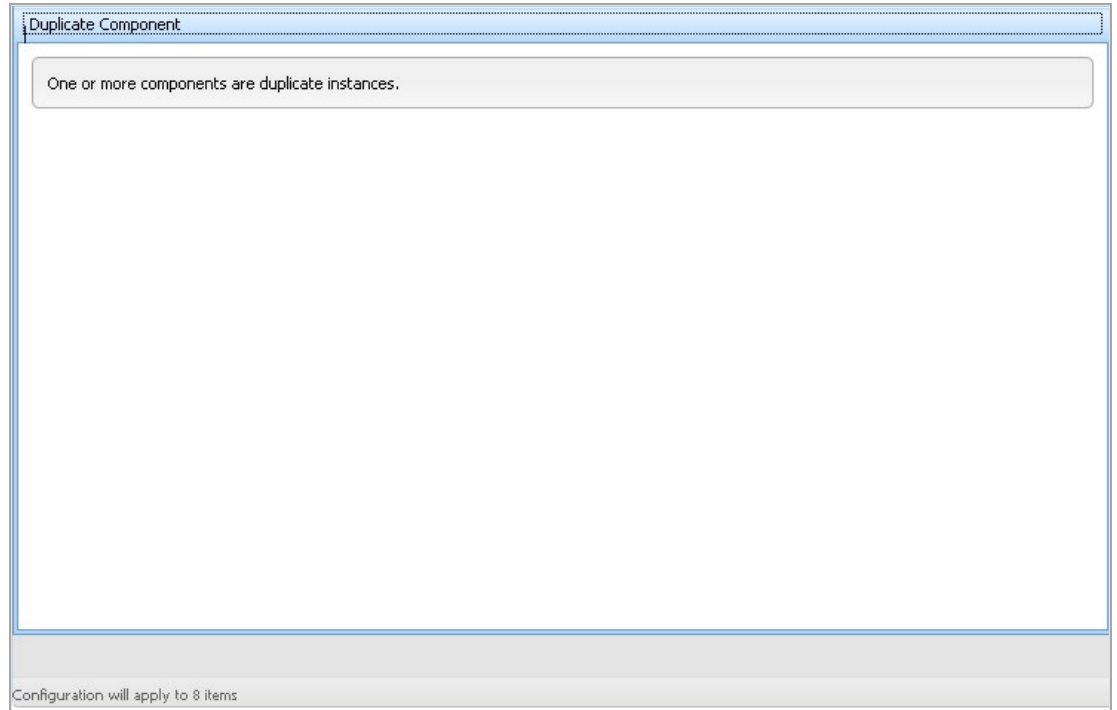


Figure 5.78 Properties > Audio Component > Duplicate Component Accordion

5.4.4.4

Modules Pane

The column pane on the right of the web page displays allocation of resources. The pane displays the modules available and provides three sub-tabs, **Overview**, **Services** and **Details**.

Note: If your monitor screen width is less than 1300 pixels, the **Monitor** pane may be collapsed automatically. Double-click on any pane title to restore.

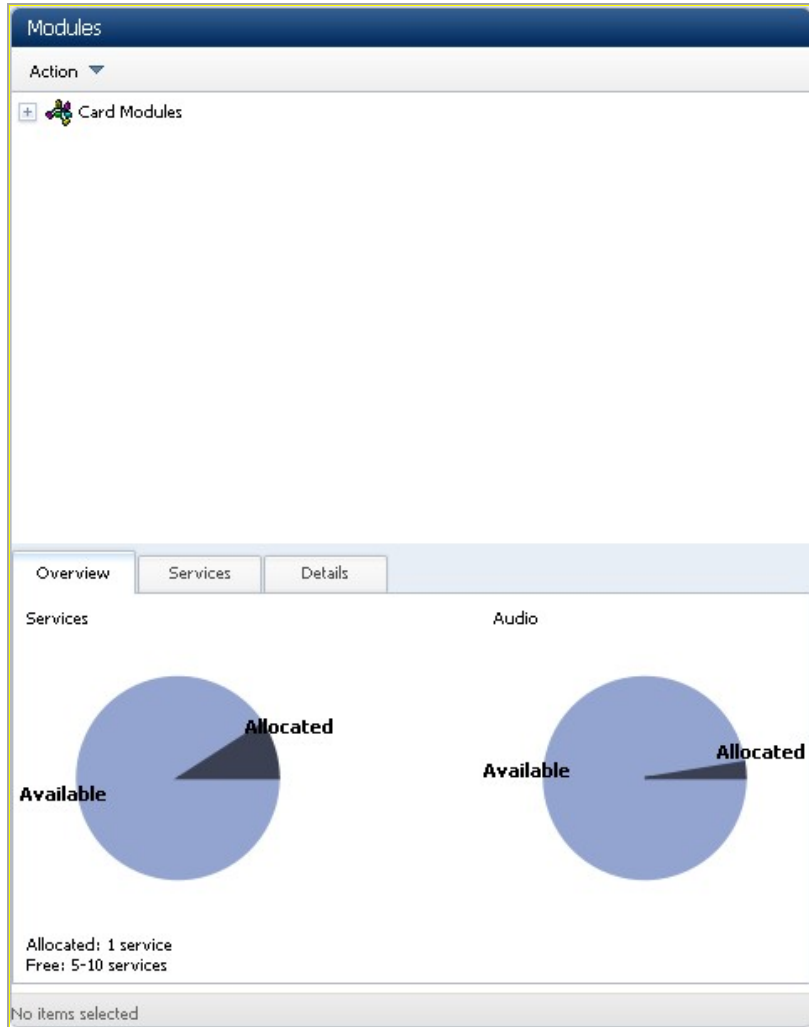


Figure 5.79 Modules Pane

5.4.4.4.1 Modules > Card Modules

By expanding the Card Modules icon at the top of the pane, the Media Processing Modules are displayed in the available slots of the unit.

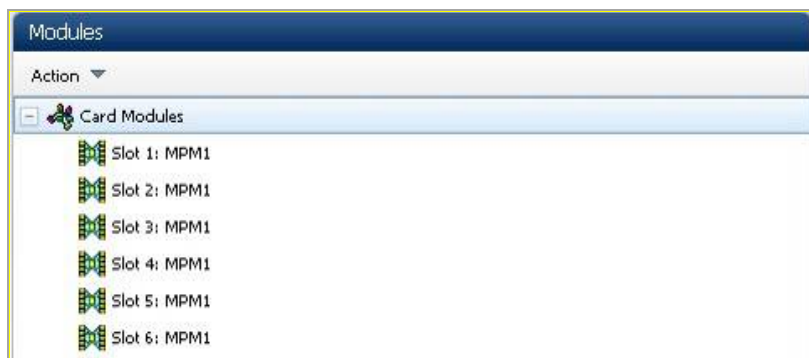


Figure 5.80 Modules > Card Modules

5.4.4.4.2 Modules Action Menu

The **Modules** pane **Action** button provides menu options for managing the content of the **Modules** pane.

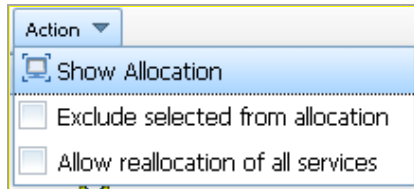


Figure 5.81 Modules > Action Menu

- **Show Allocation** –For the slots highlighted in the **Modules** pane, this will highlight in the output pane which services are actually being transcoded on these slot(s).
- **Excluded selected from allocation** – When selected, excludes the selected module from allocation of services, i.e. the module will not be used. If services are currently being transcoded on this module, they will be reallocated to another free module, if available. Note that the reallocation will not actually occur on the unit until **Apply** is pressed.
- **Allow reallocation of all services** – When selected, this allows the allocation algorithm to move existing services in order to try and free up space to allocate new services (either because new services are being added to an existing configuration or a module has been excluded). Thus, when selected, existing services may glitch briefly when the new configuration is applied. If it is not selected, existing services will not glitch, though the allocation may not be optimum. In practice, the only reason to select this is if you are having trouble getting a configuration to fit onto your unit.

5.4.4.4.3 Modules > Overview

Selecting this tab displays the amount of resource allocated or available with the configuration currently set up on the page. By hovering over the graphics, further details are displayed.



Figure 5.82 Modules > Overview Pane

5.4.4.4 Modules > Services

This pane enables you to see which services are allocated, available or potentially available. To view the services, select the **Services** tab from the **Modules** pane. By hovering over the graphics, further details are displayed.

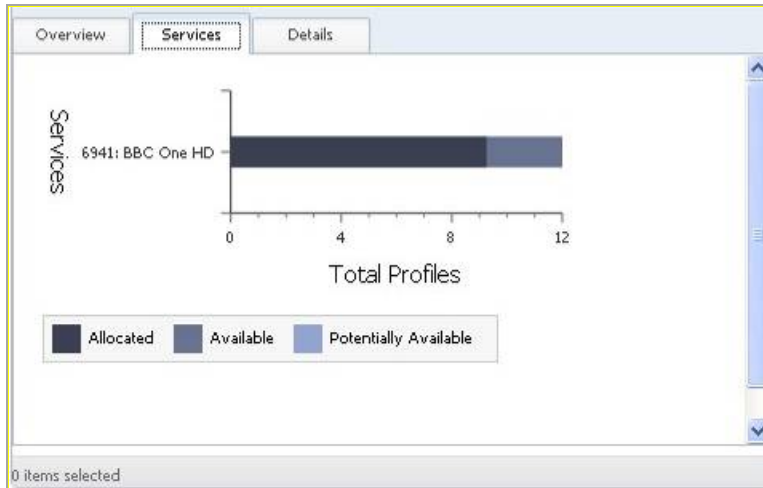


Figure 5.83 Modules > Service Pane

5.4.4.5 Modules > Details

To view more details of the available modules, select the **Details** tab which will show the allocated/available breakdown for each transcode type. By hovering over the graphics, further details are displayed.

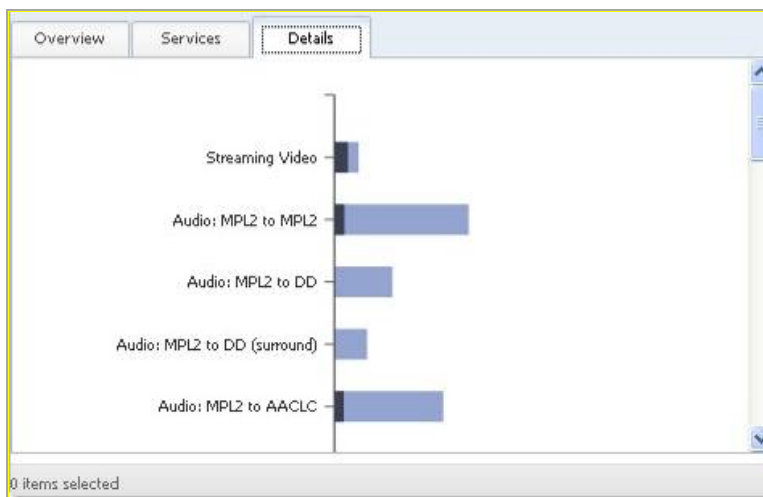


Figure 5.84 Modules > Details Pane

5.4.4.5 Information Pane

At the bottom of the **Configure > Services** page is an **Information** pane. This page provides further sub-tabs for **Warnings**, **Errors** and **Changes**.



Figure 5.85 Information Pane

5.4.4.5.1 Warnings

Warnings are listed here when you make changes to a configuration and attempt to configure a system that cannot be realized with the resources that you currently have. A description of the warning is given along with an explanation of the **Cause** and a possible **Solution** for you to attempt.

Warnings about your attempted changes can be ignored, by clicking the **Apply Changes** button, but you may lose services or profiles as a result.

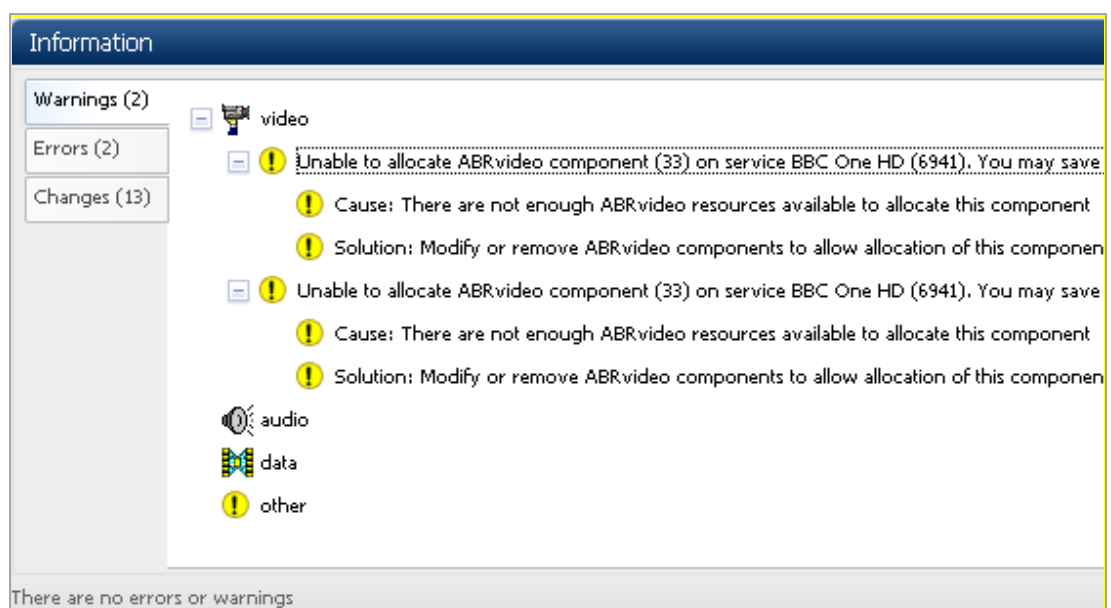


Figure 5.86 Information - Warnings

5.4.4.5.2 Errors

Errors are listed here when you attempt to configure a service incorrectly or fail to supply sufficient data to complete your configuration. A description of the error is given along with an explanation of the **Cause** and a possible **Solution** for you to attempt.

When Errors are indicated you will not be able to save the configuration by clicking the **Apply Changes** button.

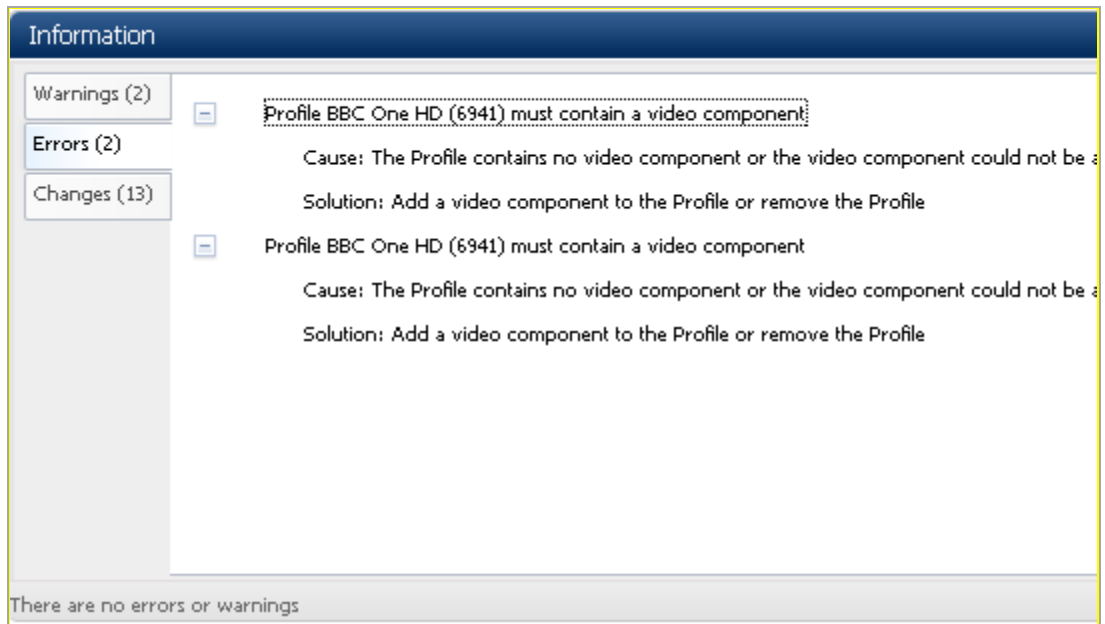


Figure 5.87 Information – Errors

5.4.4.5.3 Changes

Changes are listed here when you modify the configuration in the Input, Output or Properties panes. Changes are not implemented until the **Apply Changes** button is clicked.



Figure 5.88 Information – Changes

Any changes made to the configuration are **highlighted in orange** to enables you to spot them clearly. When the **Apply Changes** button is clicked they return to black.

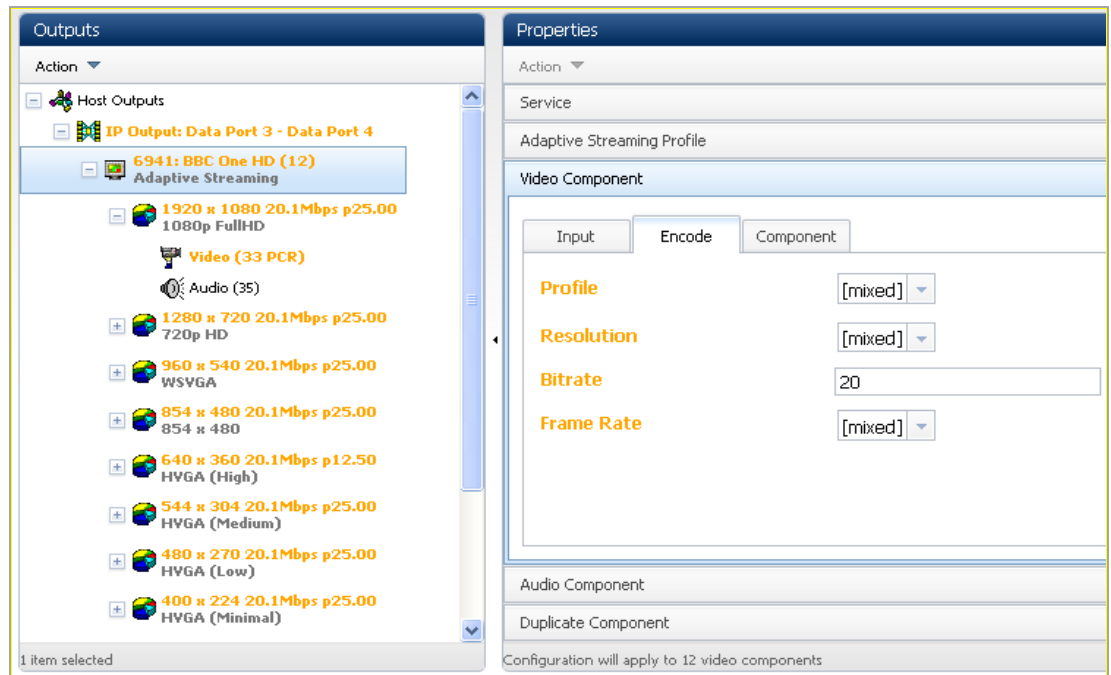


Figure 5.89 Information – Changes Highlighted

5.4.5 Configure > Config Report

When the unit has been configured, the current state of the unit can be determined from the **Config Report** page.

To view this page, select the **Config Report** tab from the main **Configure** page.

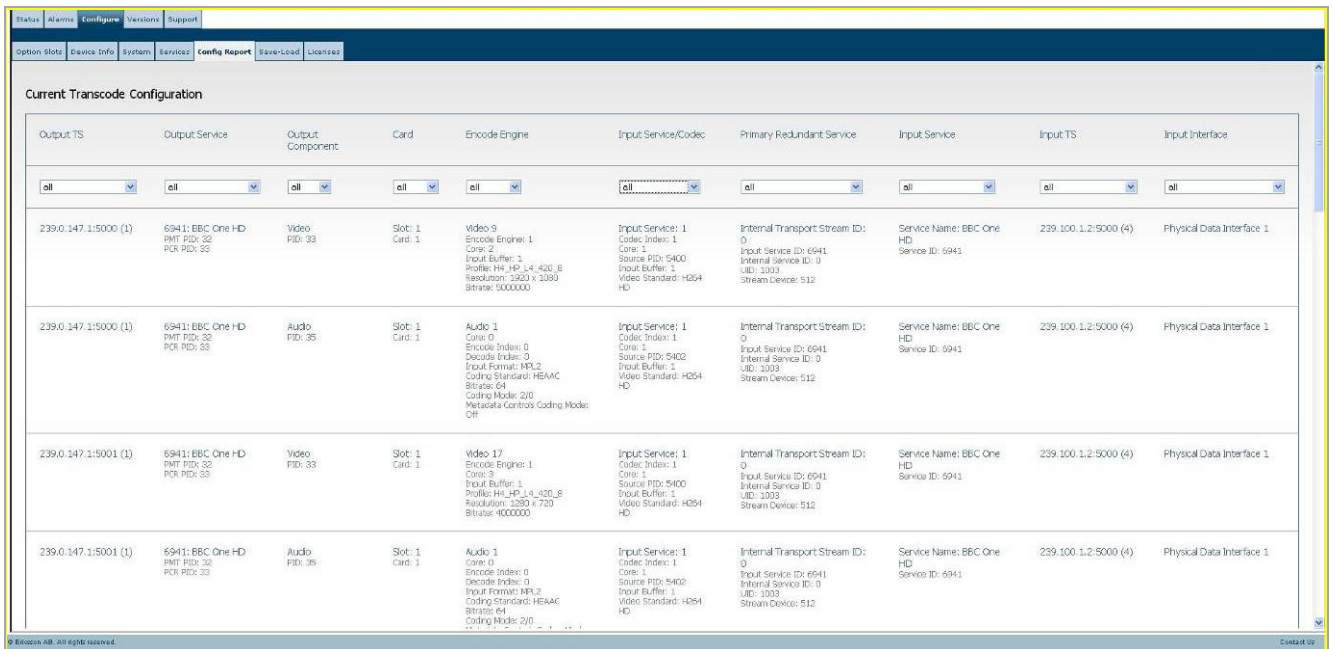


Figure 5.90 Configure > Config Report

The initial view shows each component of each service. The report indicates all known data about the component, and also to which module and encode engine the component has been allocated. The report is arranged in columns:

- Output TS
- Output Service
- Output Component
- Card (MPM)
- Encode Engine
- Input Service/Code
- Primary Redundant Service
- Input Service
- Input TS
- Input Interface

Drop-down boxes at the top of the report enable the user to filter which elements to view. In this way, particular components can be found rapidly and accurately, enabling stream faults to be found with ease.

Status Alarms Configure Versions Support				
Option Slots Device Info System Services Config Report Save-Load Licenses				
Current Transcode Configuration				
Output TS	Output Service	Output Component	Card	Encode Engine
all	all	all	all	all
239.0.147.1:5000 (1) 239.0.147.1:5001 (1) 239.0.147.1:5002 (1) 239.0.147.1:5003 (1) 239.0.147.1:5004 (1) 239.0.147.1:5005 (1) 239.0.147.1:5006 (1) 239.0.147.1:5007 (1) 239.0.147.1:5008 (1)	6941: BBC One HD PMT PID: 32 PCR PID: 33	Video PID: 33	Slot: 1 Card: 1	Video 9 Encode Engine: 1 Core: 2 Input Buffer: 1 Profile: H4_HP_L4_420_8 Resolution: 1920 x 1080 Bitrate: 5000000
239.0.147.1:5000 (1)	6941: BBC One HD PMT PID: 32 PCR PID: 33	Audio PID: 35	Slot: 1 Card: 1	Audio 1 Core: 0 Encode Index: 0 Decode Index: 0 Input Format: MPL2 Coding Standard: HEAAC Bitrate: 64 Coding Mode: 2/0 Metadata Controls Coding Mode Off
239.0.147.1:5001 (1)	6941: BBC One HD PMT PID: 32	Video PID: 33	Slot: 1 Card: 1	Video 17 Encode Engine: 1

Figure 5.91 Configure > Config Report - Filtering

5.4.6 Configure > Save-Load

To view this page, select the **Save-Load** tab from the main **Configure** page.

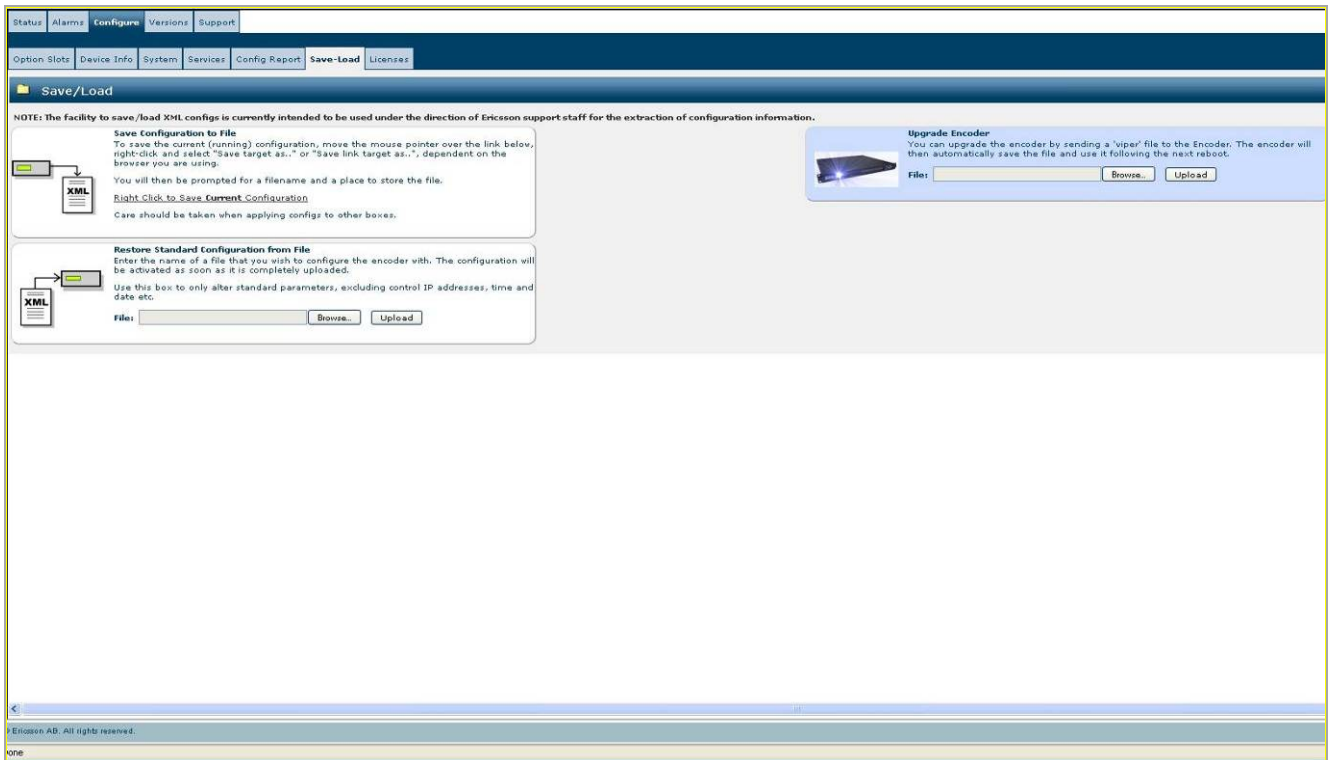


Figure 5.92 Configure > Save-Load Web Page

5.4.6.1 Save Configuration to File

This feature enables the current configuration to be saved as an XML file. This may then be used as a back-up to archive your configuration settings for Transport Streams, Services and Profiles entered on the web pages.

You can upload them (using the **Restore Configuration from File** feature, described below) in the event that the settings have been changed or lost, or to quickly load another machine with an identical configuration, if required.

It can also be useful to store frequent back-ups of your configuration during system setup or to send a copy of the xml file to Customer Support in the event of problems with your unit.

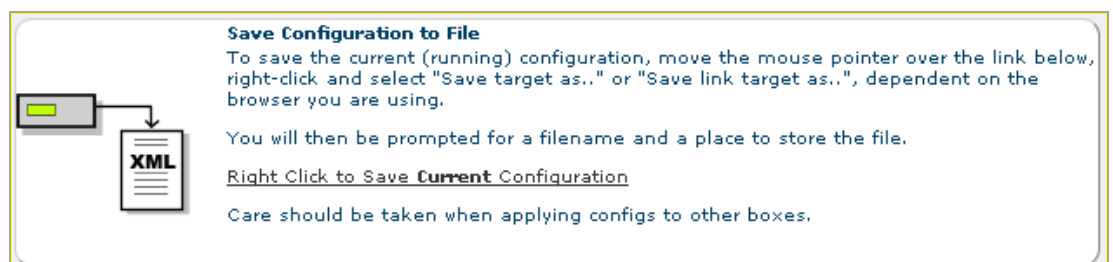


Figure 5.93 Save Configuration to File

5.4.6.2 Restore Standard Configuration from File

This feature enables the configurations stored as an XML file to be uploaded to the unit. This will normally be a configuration file that has previously been saved (using the **Save Configuration to File** feature, described above) from this or another similar equipment.

This provides a quick and simple method of restoring a unit to operation, provided that up-to-date back-ups are maintained.

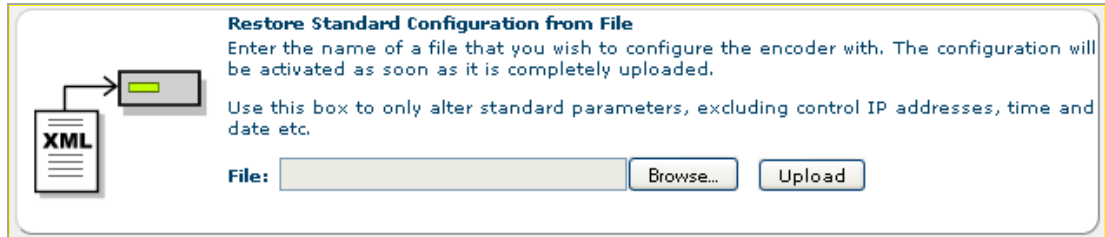


Figure 5.94 Restore Standard Configuration from File

The uploaded configuration will be actioned immediately, when completed, provided that the file is valid. In the event of an invalid file being uploaded, none of the equipment settings will be changed.

5.4.6.3 Upgrade Encoder

This feature enables new software to be uploaded to the unit. This feature should be used only under direction from Ericsson Customer Support.

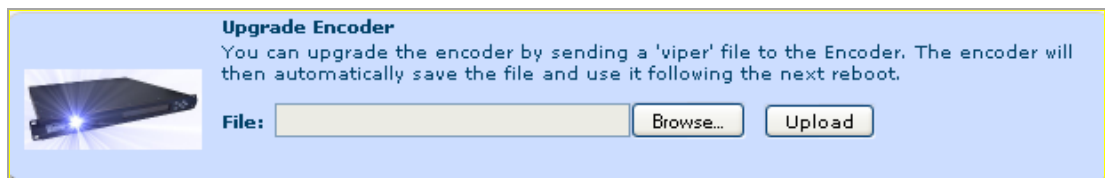


Figure 5.95 Upgrade Encoder

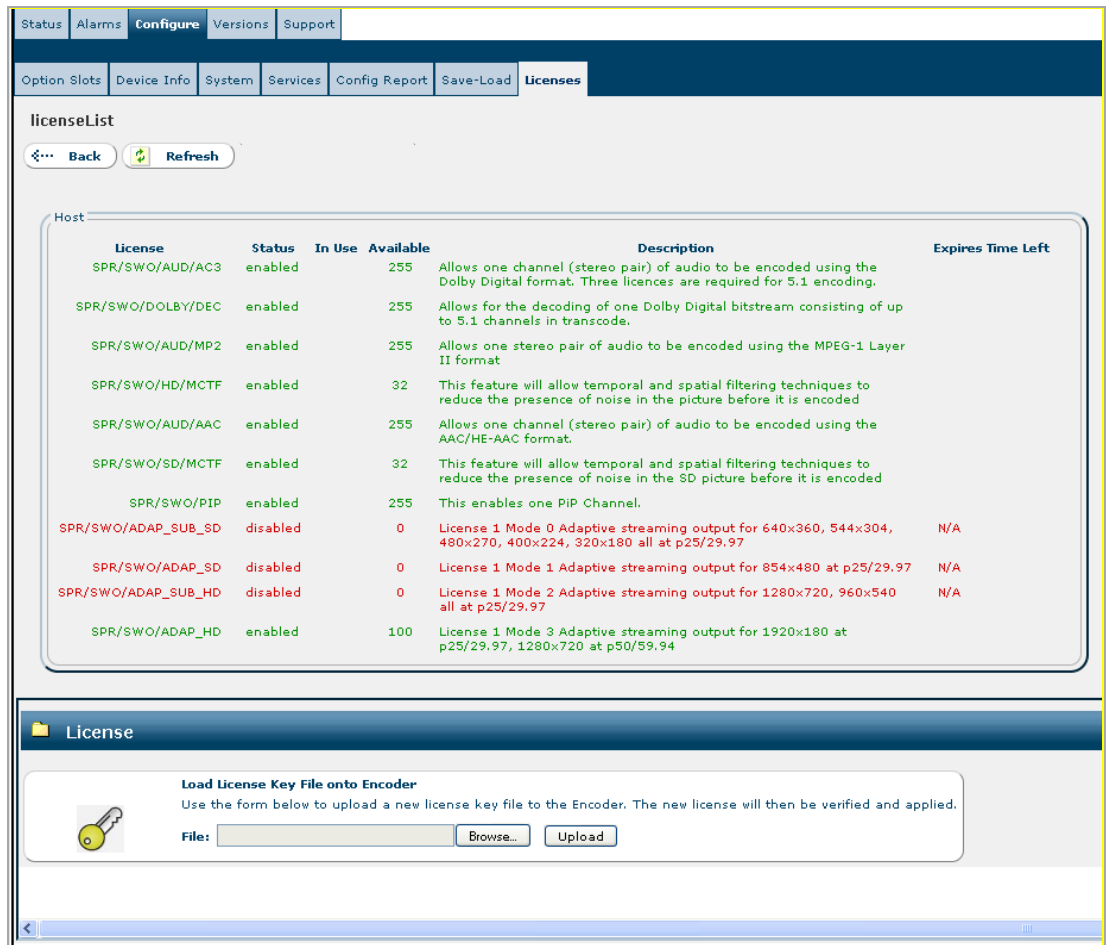
5.4.7 Configure > Licenses

To view this page, select the **Licenses** tab from the main **Configure** page.

This web page details all the current licenses for features and options installed on the unit and enables new licenses to be installed.

The list of current licenses is color-coded:

- **Green** – license is enabled for this feature and available to use.
- **Red** – license is disabled and the relevant feature is unavailable. This indicates that a license has expired.



licenseList

Back Refresh

License	Status	In Use	Available	Description	Expires Time Left
SPR/SWO/AUD/AC3	enabled		255	Allows one channel (stereo pair) of audio to be encoded using the Dolby Digital format. Three licences are required for 5.1 encoding.	
SPR/SWO/DOLBY/DEC	enabled		255	Allows for the decoding of one Dolby Digital bitstream consisting of up to 5.1 channels in transcode.	
SPR/SWO/AUD/MP2	enabled		255	Allows one stereo pair of audio to be encoded using the MPEG-1 Layer II format	
SPR/SWO/HD/MCTF	enabled		32	This feature will allow temporal and spatial filtering techniques to reduce the presence of noise in the picture before it is encoded	
SPR/SWO/AUD/AAC	enabled		255	Allows one channel (stereo pair) of audio to be encoded using the AAC/HE-AAC format.	
SPR/SWO/SD/MCTF	enabled		32	This feature will allow temporal and spatial filtering techniques to reduce the presence of noise in the SD picture before it is encoded	
SPR/SWO/PIP	enabled		255	This enables one PIP Channel.	
SPR/SWO/ADAP_SUB_SD	disabled		0	License 1 Mode 0 Adaptive streaming output for 640x360, 544x304, 480x270, 400x224, 320x180 all at p25/29.97	N/A
SPR/SWO/ADAP_SD	disabled		0	License 1 Mode 1 Adaptive streaming output for 854x480 at p25/29.97	N/A
SPR/SWO/ADAP_SUB_HD	disabled		0	License 1 Mode 2 Adaptive streaming output for 1280x720, 960x540 all at p25/29.97	N/A
SPR/SWO/ADAP_HD	enabled		100	License 1 Mode 3 Adaptive streaming output for 1920x180 at p25/29.97, 1280x720 at p50/59.94	

License

Load License Key File onto Encoder

Use the form below to upload a new license key file to the Encoder. The new license will then be verified and applied.

File: Browse... Upload

Figure 5.96 Configure > Licenses

See *Chapter 7, Options, Licensing and Upgrades* for further instructions on obtaining and installing licensed features on your unit.

5.5 Versions

Details of the unit's components can be viewed from the **Versions** tab web page. Further tabs can be selected from this top-level tab, which show the **Build**, **Detail** and **Hardware** for the Host and Slots.

5.5.1 Versions > Build

To view the build status of the unit components select the **Build** tab from the **Versions** top-level tab.

<div> <div>Status</div> <div>Alarms</div> <div>Configure</div> <div>Versions</div> <div>Support</div> </div>			
<div> <div>Build</div> <div>Details</div> <div>Hardware</div> </div>			
<div> <div>Back</div> <div>Refresh</div> </div>			
System			
System	Actual Version	Expected Version	
	Unknown		Uncontrolled release
Host			
Applications	Actual Version	Expected Version	
	Version Mismatch	6.10.0.90676	Version Mismatch
BootFPGAFactory	0.1.7.20227		Version OK
BootFPGAApplication	0.1.7.20227	0.1.7.20227	Version OK
ClockFPGA	1.0.0.33116	1.0.0.33116	Version OK
MainFPGA	2.8.1.85509	2.8.1.85509	Version OK
HostBSPFactory	1.1.3.36652		Version OK
HostBSPApplication	6.10.0.85794	6.10.0.85794	Version OK
Host Package	Version Mismatch		
Slot 1			
Applications	Actual Version	Expected Version	
	6.10.0.90676	6.10.0.90676	Version OK
AudioDSP	2.0.9.957	2.0.9.957	Version OK
Look-ahead_Main_Software	1.2.4.3404	1.2.4.3404	Version OK
Look-ahead_DSP_Software	1.2.4.3401	1.2.4.3401	Version OK
Look-ahead_BLD_Software	0.0.0.610	0.0.0.610	Version OK
BackEndFPGAApplication	3.7.50.0	3.7.50.0	Version OK
BackEndFPGAFailSafe	0.1.11.32619		Version OK
BSPFailSafe	1.1.3.36663		Version OK
PreProcessor	1.0.1.90481	1.0.1.90481	Version OK
BSPApplication	6.10.0.90607	6.10.0.90607	Version OK
Slot 1 Package	6.10.0.90676		
Slot 2			
Applications	Actual Version	Expected Version	
	6.10.0.90676	6.10.0.90676	Version OK
AudioDSP	2.0.9.957	2.0.9.957	Version OK
Look-ahead_Main_Software	1.2.4.3404	1.2.4.3404	Version OK
Look-ahead_DSP_Software	1.2.4.3401	1.2.4.3401	Version OK
Look-ahead_BLD_Software	0.0.0.610	0.0.0.610	Version OK
BackEndFPGAApplication	3.7.50.0	3.7.50.0	Version OK
BackEndFPGAFailSafe	0.1.11.32619		Version OK
BSPFailSafe	1.1.3.36663		Version OK
PreProcessor	1.0.1.90481	1.0.1.90481	Version OK

Figure 5.97 Version > Build Web Page

The web page displays the **Actual** and **Expected** build version numbers for the different software components that are used in the Host and the Slots. Confirmation that the appropriate software has been detected is given by a **Version OK** message in the end column. If the software actual and expected versions are incorrect a **Version Mismatch** message is displayed in red.

5.5.2 Versions > Details

To view the detail of the software components select the **Details** tab from the **Versions** top-level tab.

Status

Alarms

Configure

Versions

Support

Build

Details

Hardware

⏮

Back

🔄

Refresh

System

	Actual Version	Expected Version	
System	Unknown		Uncontrolled release

Host

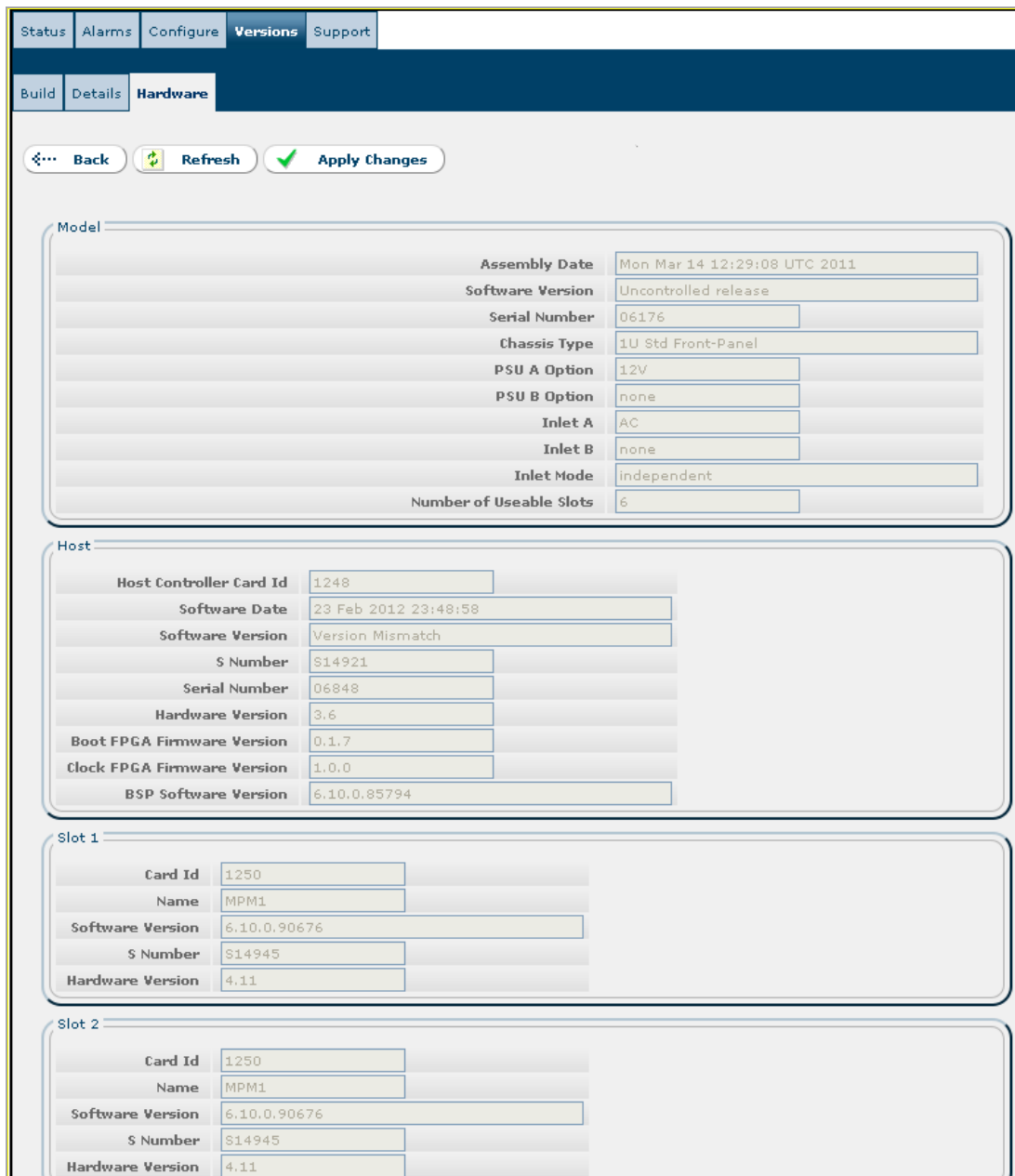
	Actual Version	Expected Version	
antlr3c	90676	90676	Version OK
boost	90676	90676	Version OK
curlftp	90676	90676	Version OK
curl	90676	90676	Version OK
fuse	90676	90676	Version OK
glib	90676	90676	Version OK
libiconv	90676	90676	Version OK
aceXmlCmd	90676	90676	Version OK
CGIexec	90676	90676	Version OK
ConfTool	90676	90676	Version OK
DemuxManager	90676	90676	Version OK
ExtractFileVersion	90676	90676	Version OK
FpgaTool	90676	90676	Version OK
FrontPanel	90676	90676	Version OK
FuseLicenseKey Starter	90676	90676	Version OK
GetCRC32	90676	90676	Version OK
GetSystemBuildVersion	90676	90676	Version OK
GetVersion	90676	90676	Version OK
IPInputManager	90676	90676	Version OK
IPManager	90676	90676	Version OK
ipoffload	90676	90676	Version OK
LicenseFileProcessing	90676	90676	Version OK
LicenseKeyManagerApp	90676	90676	Version OK
MethodCmd	90676	90676	Version OK
MgpApp	90676	90676	Version OK
NetworkConfigToXml	90676	90676	Version OK
NetworkManager	90676	90676	Version OK
NetworkXmlToXml	90676	90676	Version OK
OptionCardSupportApp	90676	90676	Version OK
OptionSlotMonitorApp	90676	90676	Version OK
ParameterStore	90676	90676	Version OK
PersistenceStorageApp	90676	90676	Version OK

Figure 5.98 Version > Detail Web Page

This web page displays the **Actual** and **Expected** build version numbers for the unit detailed software components. Confirmation that the appropriate software has been detected is given by a **Version OK** message in the end column. If the software actual and expected versions are incorrect a **Version Mismatch** message is displayed in **red**.

5.5.3 Versions > Hardware

To view information about the hardware components select the **Hardware** tab from the **Versions** top-level tab.



The screenshot shows the 'Versions > Hardware' web page. It features a top navigation bar with tabs: Status, Alarms, Configure, Versions (selected), and Support. Below this is a sub-navigation bar with tabs: Build, Details, and Hardware (selected). The main content area has three buttons: Back, Refresh, and Apply Changes. The page is divided into three main sections: Model, Host, and Slot 1, with Slot 2 partially visible at the bottom.

Model	
Assembly Date	Mon Mar 14 12:29:08 UTC 2011
Software Version	Uncontrolled release
Serial Number	06176
Chassis Type	1U Std Front-Panel
PSU A Option	12V
PSU B Option	none
Inlet A	AC
Inlet B	none
Inlet Mode	independent
Number of Useable Slots	6

Host	
Host Controller Card Id	1248
Software Date	23 Feb 2012 23:48:58
Software Version	Version Mismatch
S Number	S14921
Serial Number	06848
Hardware Version	3.6
Boot FPGA Firmware Version	0.1.7
Clock FPGA Firmware Version	1.0.0
BSP Software Version	6.10.0.85794

Slot 1	
Card Id	1250
Name	MPM1
Software Version	6.10.0.90676
S Number	S14945
Hardware Version	4.11

Slot 2	
Card Id	1250
Name	MPM1
Software Version	6.10.0.90676
S Number	S14945
Hardware Version	4.11

Figure 5.99 Version > Hardware Web Page

The web page displays the **Actual** and **Expected** hardware version numbers for the different hardware components that are used in the Host and the Slots.

5.6 Support

Various logs may be retrieved via xml files and may be viewed from the **Support** tab. Further tabs can be selected from the top-level tab, which show **View Logs** and **System Files**.

5.6.1 Support > View Logs

To view the log files select the **View Logs** tab from the **Support** top-level tab.

These log files may be useful, and may be asked for by Ericsson Customer Support, in the event of a problem with your unit.

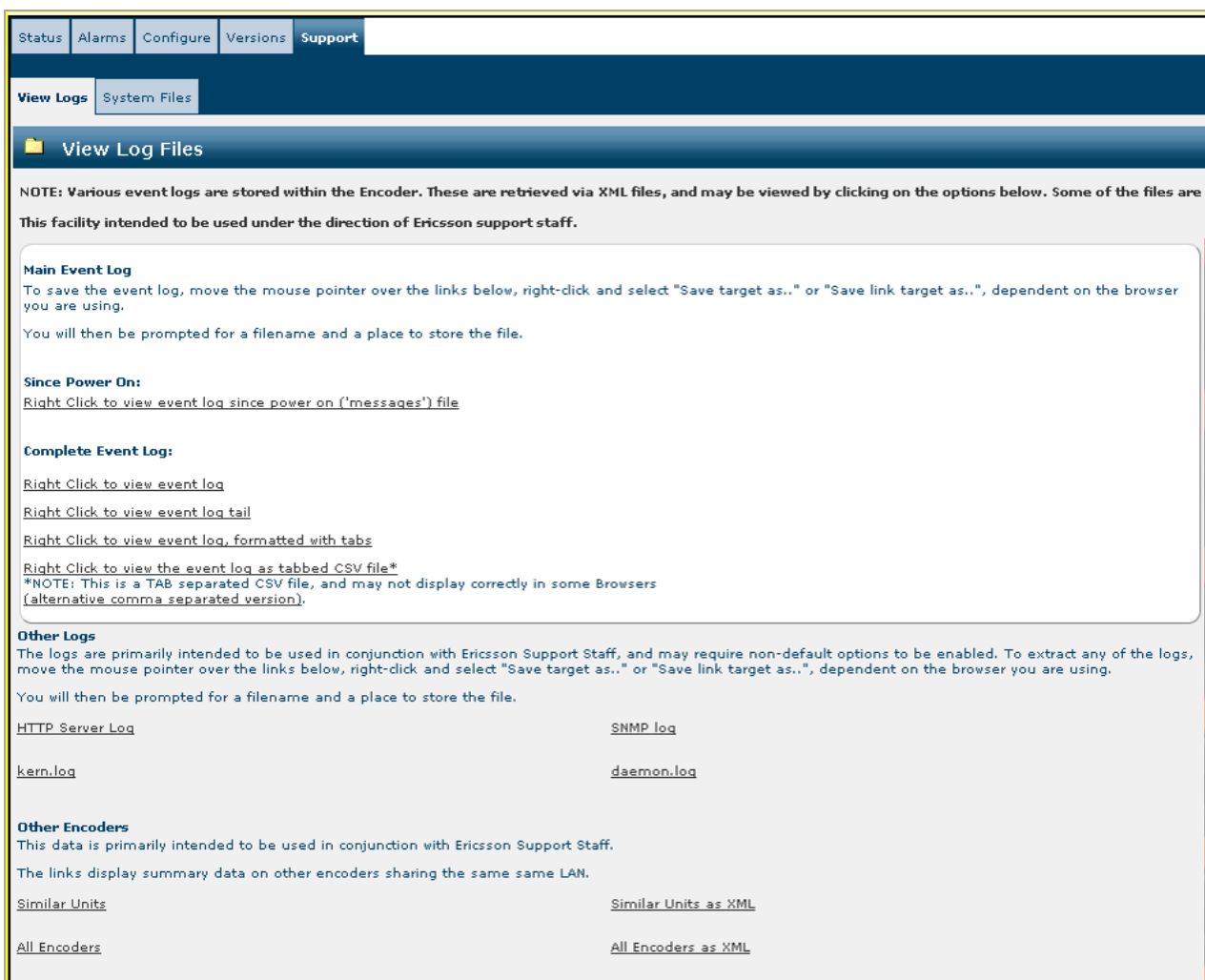


Figure 5.100 Support > View Logs Web Page

The following 'main' log files may be retrieved by right-clicking on the relevant link and selecting '**Save target As**', '**Save Link target as...**', or similar:

- Event log since power on (messages) file.
- Complete event log.
- Event log tail.
- Event log formatted with tabs.
- Event log as tabbed CSV file.
- Event log as comma-separated variables.

Other log files may also be retrieved from this web page, Again, right-click on the relevant link and select '**Save target As**', '**Save Link target as...**', or similar:

- HTTP server log.
- SNMP log.
- kern log.
- daemon log.
- Similar units
- Similar units as XML file.
- All encoders.
- All encoders as XML file.

5.6.2 **Support > System Files**

To view these files select the **System Files** tab from the **Support** top-level tab.

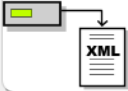
These system files may be useful, and may be asked for by Ericsson Customer Support, in the event of a problem with your unit.

StatusAlarmsConfigureVersionsSupport

View LogsSystem Files

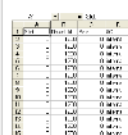
Download Files

NOTE: These files are intended to be used under the direction of Ericsson support staff for the extraction of configuration information. The files must be used with caution




XML Config
Details the current configuration of this Encoder. Right click on the link below to extract the document. You will then be prompted to save the document.
[Full XML Config](#)

Message Log
This lists various events and would be required to debug any problems encountered.
[Log since power on](#)
Extended log. Depending upon how long the encoder has been on, this may include information from before the last power-on.



Get Versions as CSV file
To extract a list of all the versions on this encoder as a .csv file, move the mouse pointer over the link below, right-click and select "Save target as.." or "Save link target as..", dependent on the browser you are using.
You will then be prompted for a filename and a place to store the file.
[Right Click to Save Versions List](#)

View XSD Document

This is the document which is used to format the XML config.
[Left click on this link to display the document](#)

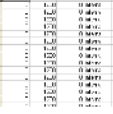
Save Possible Errors as CSV file

To extract a list of all the possible errors on this encoder as a .csv file, move the mouse pointer over the link below, right-click and select "Save target as.." or "Save link target as..", dependent on the browser you are using.
You will then be prompted for a filename and a place to store the file.
[Right Click to Save Error List](#)

Figure 5.101 Support > System Files Web Page

The following system files may be retrieved by right-clicking on the relevant link and selecting '**Save target As**', '**Save Link target as...**', or similar:

- **XML Config.** Details the current configuration of the unit.
- **Message Log.** Lists various events and may be required to debug any problems encountered.
- **Versions CSV File.** A list of all the version information for the unit.
- **XSD Document.** The XML Schema file used to format the XML Config file.
- **Error List CSV File.** A list of all the possible errors on the unit.

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Stream Processing and Networking

Chapter 6

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6.1 Introduction to Transport Streams

6.1.1 IP Encapsulation of MPEG Transport Streams

An MPEG Transport Stream has the following format.

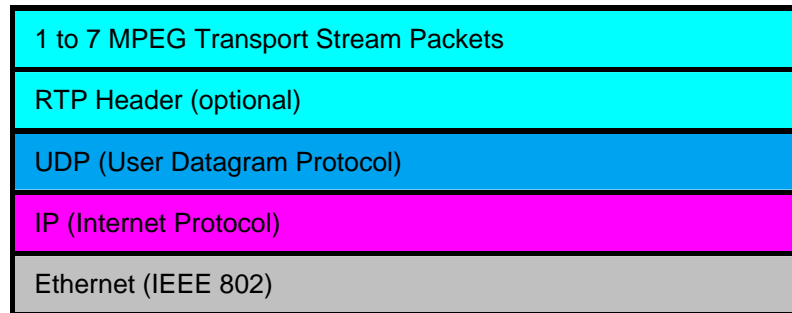


Figure 6.1 Mapping of MPEG-2 TS Packets

Between one and seven MPEG transport stream packets are carried in a UDP packet.

The UDP packet may optionally also contain an Real Time Protocol (RTP) header, which adds additional information such as a sequence number and a timestamp, which can help in the detection of packet loss across a network. The RTP header is 12 bytes long.

The UDP header is 8 bytes long.

The network layer protocol is IPV4, which adds a 20 byte header to every packet.

The physical link layer is then Ethernet at either 100 Mbps or 1000 Mbps.

6.1.2 Mapping of MPEG-2 TS Packets

The mapping of MPEG-2 TS packets into IP data frames is done according to the protocol stack shown in the following illustration.

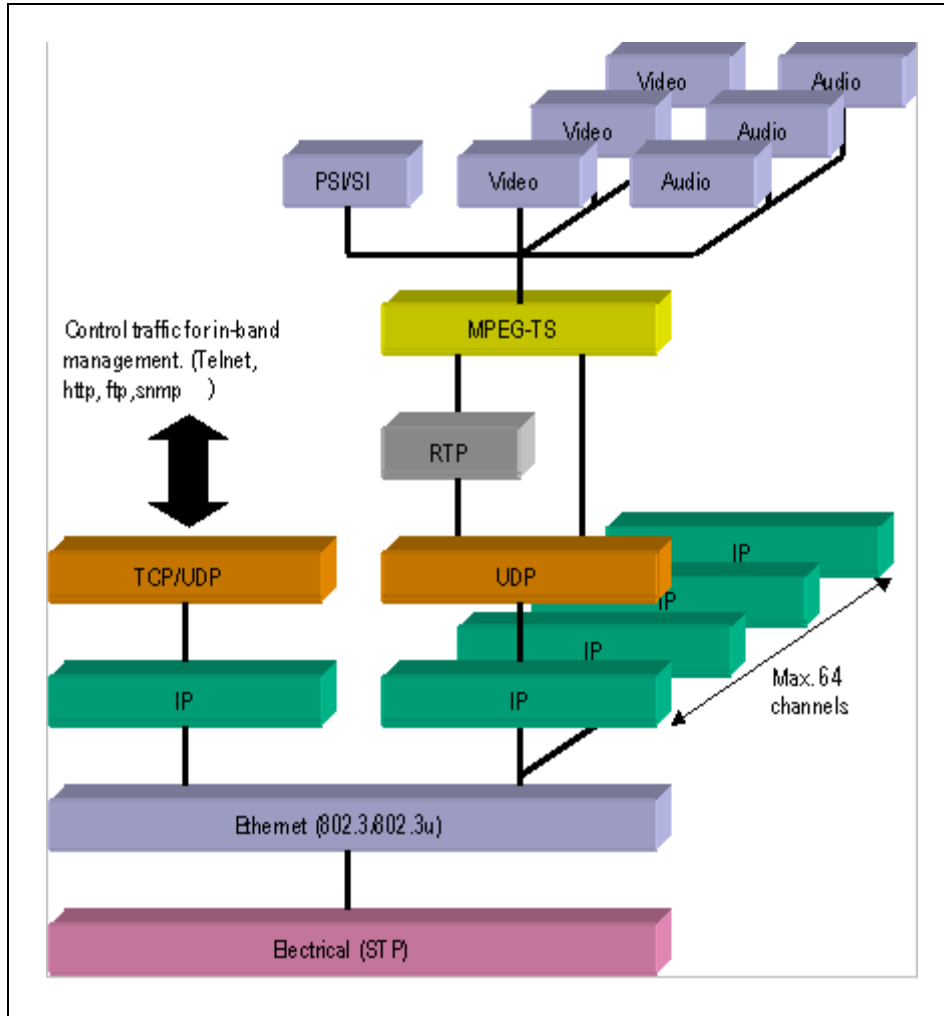


Figure 6.2 Mapping of MPEG-2 TS Packets

6.1.3 MPEG Layer

The MPEG-2/DVB layer is specified in **ISO/IEC IS 13818 Generic Coding of Moving Pictures and Associated Audio**. The main functionality of this layer is to transform MPTS (Multi-Program Transport Streams) into a number of SPTS (Single-Program Transport Streams). A Transport Stream carrying multiple programs is in this way split into a number of 'mini' Transport Streams, each carrying a single program. This ensures that the video can be passed through limited bandwidth links such as ADSL further down the transmission path.

6.1.4 RTP Layer

The RTP layer is optional, and will add an 8 byte RTP header to the new packet. This header contains a sequence number and a time stamp.

6.1.5 UDP Layer

The UDP layer is according to **RFC768 User Datagram Protocol**. The user can control the target UDP port number for the MPEG stream. A configurable number of 188 byte long MPEG-2 TS packets are mapped straight into an UDP frame with no additional overhead. The MTU for Ethernet is usually 1500 bytes. This limits the number of MPEG-2 TS packets per UDP frame to lie within 1 to 7. The following illustration shows the mapping of MPEG-2 Transport Streams into UDP packets.

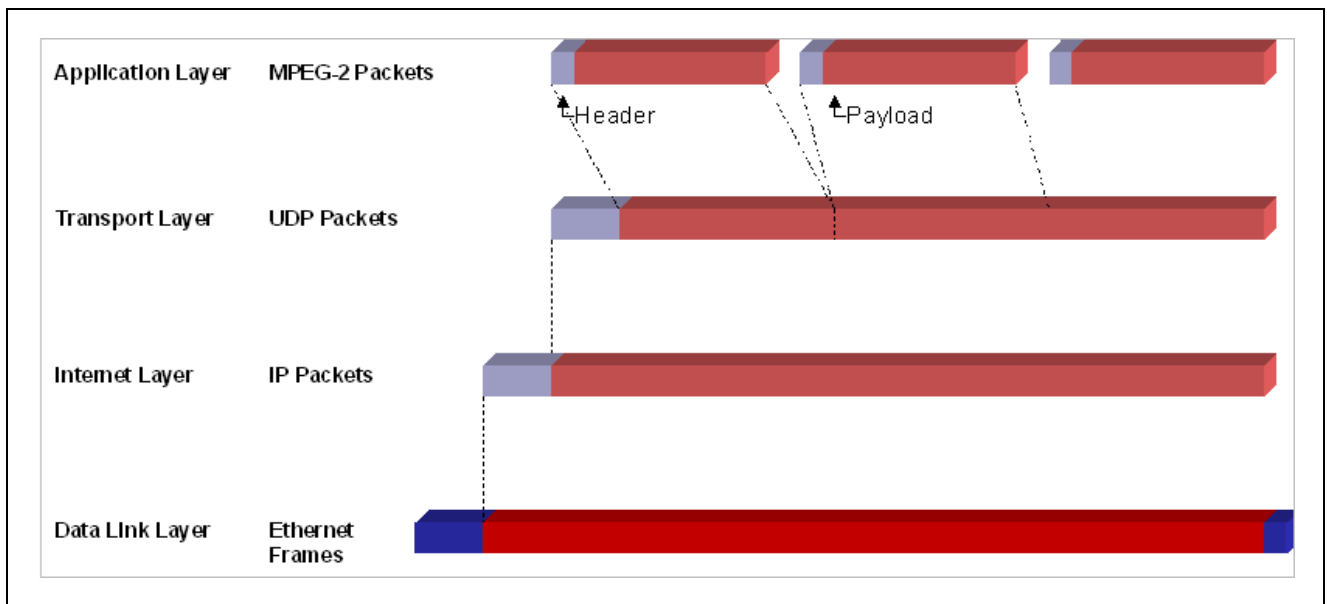


Figure 6.3 Mapping of MPEG-2 TS Packets

6.1.6 IP Layer

The IP layer is according to **RFC791 Internet Protocol Specification**. The user is allowed access to the following IP header fields: IP source address, IP destination address, Time-To-Live field, Type-Of-Service field. Performing static mapping between class-D IP addresses and the corresponding Ethernet multicast MAC addresses supports limited IP Multicasting (Type 1).

6.1.7 Ethernet Layer

The data link layer is Ethernet according to IEEE 802.3/802.3u (auto sensing 10/100 Mbps, Twisted Pair, RJ-45 connector).

6.1.8 IP Overhead

The IP overhead calculation when mapping MPEG-2 TS packets into IP frames is shown in Table 6.1.



Table 6.1 IP Overhead

Item	Overhead factor	Comments
MPEG-2 TS	1.0	
UDP	$1324/1316 = 1.006$	UDP header=8 bytes
IP	$1344/1324 = 1.015$	IP header=20 bytes
Ethernet	$1358/1344 = 1.010$	Eth header=14 bytes

Total overhead factor becomes: $1.006 \times 1.015 \times 1.010 = 1.031$ or 3.1% overhead.

Note: The number of MPEG-2 TS packets one can map down into each UDP frame is variable (between 1 and 7). Usually 7 is used for minimum overhead. This is also used in the above calculation.

6.2 SPR1100 Transport Streams

6.2.1 Overview

6.2.1.1 MPEG-2 Compliancy

The encapsulated Transport Stream packets (video, audio, VBI/ANC data and PCR - 188 bytes), are fully compliant MPEG-2 Transport Streams (all relevant fields completed, continuity counters, PTS/DTS, adaptation fields etc.).

6.2.1.2 Transport Streams

The system can form up to 128 output Transport Streams, with each stream mirrored on the two physical output interfaces.

Transport Streams are encapsulated in either a UDP or a UDP and RTP packet.

6.2.1.3 TS IP Output Parameters

The following parameters can be configured for a Transport Stream to be IP encapsulated and output.

Table 6.2 TS IP Output Parameters

Parameter	Value	Description
TS packets per UDP packet	1 to 7 [Default 7]	Defines the number of Transport Stream packets encapsulated in a UDP packet
TS Mode	CBR	Constant bit rate output

Parameter	Value	Description
Output Enable	Off [Default]	IP Output is disabled
	On	IP Output is enabled if the IP destination can be resolved
Dest. IP Address	aaa.bbb.ccc.ddd	The destination IP address
Source IP Port	0 to 65335 [default = 5500]	Source IP Port number
Dest. IP Port	0 to 65335 [default = 5500]	Destination IP Port number
Type Of Service	0 to 255 [Default = 4]	ToS value for inclusion in the IP header
Time To Live	0 to 240 [Default = 15]	TTL value for inclusion in the IP header
Encapsulation Type	UDP [Default]	UDP encapsulation of TS packets
	RTP	UDP/RTP encapsulation of RTP Packets
	RTP/FEC Column	UDP/RTP encapsulation of RTP Packets with added one-dimensional FEC
	RTP/FEC Column and Row	UDP/RTP encapsulation of RTP Packets with added two-dimensional FEC
Parameter	Value	Description
TS packets per UDP packet	1 to 7 [Default 7]	Defines the number of Transport Stream packets encapsulated in a UDP packet

6.2.1.4 Output Data Rate

The system is designed to support a maximum output data rate of 216 Mbps per Transport Stream, up to a total of 900 Mbps (nominally 1 Gbps) per chassis.

The bit rate of each output Transport Stream can be individually controlled with a resolution of 1 kbps.

6.2.1.5 IP Port

The IP Encapsulator within the Host Card encapsulates Transport Stream packets in either a UDP or a UDP and RTP packet before transmitting them out of the assigned Data Ethernet port(s).

6.2.2 Services

The system is capable of forming up to 72 services divided between the output transport streams. Each service can contain a maximum of 18 elementary streams, consisting of a maximum of 8 data components, 8 audio components, one main video and one PIP video component.

An elementary stream can be included in up to four services. Only one main video elementary stream can be assigned to a service, and the audio delay will be matched to the video. A PIP Video stream may also be added. Only one PCR (Program Clock Reference: A time stamp in the transport stream from which the decoder timing is derived) can be associated with a service.

6.2.2.1 Service Information Tables

The Service Information (SI) tables that the system generates for each individual output Transport Stream can be selected. The following table shows the available levels.

Table 6.3 Service Information Levels

SI Level	Description
Off	Elementary streams only
On (PAT/PMT Only)	PAT/PMT are generated
On (PAT/PMT/SDT/CAT)	The listed tables are generated. The CAT will be empty as Conditional Access is not supported in this release.

Some users may not require ETR 290 compliance, so it is possible to set the PMT (Program Map Table) repetition rate to either 100 ms (default) or 500 ms.

Note: The Program Map Table is part of the MPEG-2 Program Specific Information (PSI) data and is mandatory for MPEG-2 compliance. Each service has a PMT which lists the component parts (elementary streams of audio, video etc.) for the various services being transmitted.

6.2.2.2 Formation of SI

SI packet formation and play out is the responsibility of the host card. However it is the Media Processing Module's responsibility to provide SI data fields related to the stream that it is generating.

6.2.2.3 Repetition Rate

The repetition rate of SI packets must take into account the output Transport Stream rate, otherwise the jitter introduced by the multiplexing of packets to form the Transport Stream can lead to the SI repetition rate being too long.

6.2.3 Coded Elementary Stream

The compressed output streams from the module are in the form of MPEG-2 transport packets that have been encapsulated into a Transport Stream packet.

6.2.3.1 Supported Profiles

The SD/HD MPMI Transcoder supports the profiles listed in *Table 6.4*.

Table 6.4 Coded Elementary Stream Profiles

Profile	Specification
MPEG-2 Main profile @ Main level (MP@ML)	ISO/IEC 13818
MPEG-2 Main profile @ High level (MP@HL)	ISO/IEC 13818
H.264 Main @ Level 3.0	ITU-T H.264 or ISO/IEC MPEG-4 AVC
H.264 High @ Level 3.0	ITU-T H.264 or ISO/IEC MPEG-4 AVC
H.264 Main @ Level 4.1	ITU-T H.264 or ISO/IEC MPEG-4 AVC
H.264 High @ Level 4.1	ITU-T H.264 or ISO/IEC MPEG-4 AVC

6.2.3.2 Output Bit Rate

The output rate of the transport packets is derived from the 27 MHz reference clock and is accurate to within 1 kbps of the configured transport bit rate.

The output video bit rate of the MPM is configurable within ranges dictated by the operating mode. These ranges are listed in the MPM Feature Summary page. The configured video rate means the Transport Stream rate.

The module supports bit-stuffing to maintain configured bit rate if the operating mode requires it.

The output of a module never exceeds the configured bit rate (or bit rate ceiling).

6.2.3.3 PCR

The MPM will insert a PCR in each video stream header. See *Clock & Timing on page 6-29*.

6.2.3.4 Transport Packets

The MPM supports adaptation field stuffing of transport packets for the alignment of PES packets to transport packet boundaries. Valid continuity counter values are inserted into the transport packet headers.



6.2.4 Audio Output

6.2.4.1 Transcoding

The Audio Transcoder supports transcoding at 48 kHz only.

The audio output is formed of fully compliant MPEG-2 transport packets encapsulated into a Transport Stream packet. The module runs in aligned mode where there are an integer number of audio frames fitted into a PES packet, therefore a PES packet will be the start of an audio packet.

The audio output rate is derived from the 27 MHz reference clock.

6.2.4.2 Lip Sync

The Video Transcoder ensures that lip sync is maintained between the limits of audio leading video by 10 ms to video leading audio by 30 ms.

6.2.4.3 PID Assignment

The module enables a PID to be assigned to each audio channel separately, which includes the ability to assign separate PID's to every mono channel. The PID value is configurable.

6.2.4.3.1 Assigning PIDs

If a PID has not been assigned a value (or is a value of 0) a unique PID will be allocated to that component.

6.2.4.3.2 Duplicate PIDs

If a PID is given a value that is already in use, a Duplicate PID alarm is raised in the logs that identify the Transport Stream and PID.

Note: There is no facility to automatically re-assign duplicate PIDs to a unique value.

6.2.4.3.3 PCR Placeholders

The module enables a PCR placeholder to be put in the adaptation field of every audio PID stream. See *Clock & Timing on page 6-29*.

6.2.5 Transport Packets

6.2.5.1 Packetized Elementary Stream (PES) Packets

The Video Encoding module supports adaptation field stuffing of transport packets for the alignment of PES packets to transport packet boundaries. PES streams carry the stream_id = 0xE0.

6.2.5.2 Transport Packet Headers

PIDs used in the transport packet headers are configurable and have valid continuity counter values inserted.

6.2.5.3 Packetized Video Elementary Streams

The compressed video data is packetized within MPEG-2 PES packets which are configurable to be per picture or per GOP.

6.2.5.3.1 GOP Structure

6.2.5.3.1.1 Supported Structure

Support is included for standard IBP GOP structures with between 0 and 3 B pictures. If H264 'Baseline' profile is selected, no B frames are inserted irrespective of the GOP structure setting on the UI (since the H264 specification prohibits B frames in Baseline profile).

6.2.5.3.1.2 GOP Size

The maximum GOP size is configurable with an upper limit of 250.

6.2.5.3.1.3 B/P-Frames

The maximum number of successive B-frames (bidirectional prediction frames) in a GOP is configurable. It is possible to have up to three B-frames successively.

GOPs may be forced to be closed if the appropriate checkbox is selected in the Video Component Encode tab. Irrespective of this setting, the GOP is always closed at a segment boundary.

6.2.6 VBI Data on a Separate PID

The SPR1100 supports pass-through of Closed Caption data which is embedded in the input video stream. This is the only VBI supported.

6.3 SPR1100 Redundancy

6.3.1 Introduction to Redundancy

The following sections describe the possible operating modes, configurations and network interconnections that may be employed in a redundant system. A combination of techniques is normally required to create a working system.

The Ericsson SPR1100 is capable of providing:

- **Source Redundancy** - using input source to protect against source or network failure and ensure delivery of the Transport Stream. In the event of a source or

network failure, the SPR1100 can be configured to gather its data from a different input source; this can be the same content as the original Transport Stream or a different Transport Stream, if required.

- **IP Interface Redundancy** - using port configuration to protect against network failure and ensure delivery of the Transport Stream. In the event of a network failure, the SPR1100 can be configured to gather its data from a different input; this can be the same content as the original Transport Stream or a different Transport Stream, if required.
- **Device Redundancy** - using a hot-standby or duplicate device to protect against device failure. If a Chassis Critical alarm is asserted, the SPR1100 can hand off all transcodes to a secondary unit using a 1+1 Redundancy Setup. The unit stores a log of events such as power-on, alarm assertion and de-assertion, etc. Every event in the log has a UTC time and date stamp attached to it to a resolution of 1 second.

See *A Typical SPR1100 Redundant System* on page 6-22 for an example of a system using multiple redundancy modes.

See *Chapter 5, Web GUI Configuration* for details of how to configure redundancy using the Web GUI.

6.4 IP Interface Redundancy

Both the control and data interfaces provided by the SPR1100 can employ redundancy. Each must be configured correctly to ensure the delivery of the Transport Stream in the event of a network failure.

The following definitions are used in the network (IP Port connectivity) diagrams in this section.

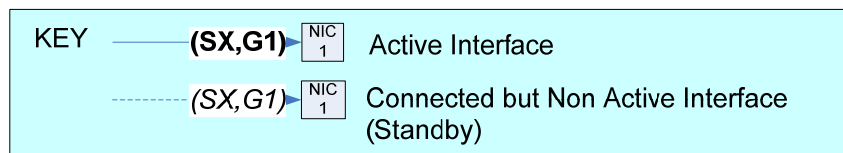


Figure 6.4 Key – Active and Connected IP Ports

Where: NICX= Network Interface Card Number (X)
 SX = Subnet Number (X)
 GX = Gateway Number (X)

6.4.1 Control Network Redundancy

The control network is assigned to the physical Ethernet ports **CTL 1** and **CTL 2**. **CTL 1** is considered to be the primary port and **CTL 2** the spare.

If both control ports have a link up, and Control Port Selection is set to **Automatic Redundant**, the primary port will respond to network traffic but the spare port will not. However, if the link goes down on the primary port, then the spare port will start to respond to network traffic.

6.4.1.1 Automatic Redundancy Mode

In Automatic Redundancy Mode the primary port is used as default. If the primary port link fails, control passes to the secondary port. However, if the primary port link is restored then control passes back to the primary after the **Auto-Revert** delay period.

The behavior of the system when the primary link is re-established depends on the Control Port Auto-Revert Time setting.

If the Control Port Auto-Revert Time is set to 0, then the spare port remains the active control port until its link goes down.

Otherwise, after the primary port has had a link present for the defined period of time, it will resume being the active control port, and the spare port will cease outputting to network traffic.

6.4.1.1.1 Auto-Revert Delay

If the control port selection is Automatic, then the Auto-Revert Delay defines the period for which the primary port must have resumed a link up state before it automatically reverts to being the active port.

The Auto-Revert Delay period is set in the range 0 to 999 seconds, with 2 seconds being the default value.

If this is set to 0 then there is no automatic switch back to the primary port.

6.4.2 Data Network Redundancy

The SPR1100 has two Ethernet data ports operating as paired outputs. These are designated **Ge 3** and **Ge 4**.

Each port may have a different IP address, MAC address, subnet mask and default gateway, providing output network redundancy. Only one port is active at any time, with the other port in **Standby** mode. If the **Active** interface should fail, the **Standby** interface takes over.

If both ports are configured to be on the same subnet, only one port will respond to ICMP messages.

The data ports can raise an alarm during abnormal operational conditions, see *Chapter 8, Preventive Maintenance and Fault-finding*.

6.4.3 Same Network Mode

In a Same Network Mode (also known as a Same Subnet Mode), both interfaces are connected into the same network segments and must be isolated at the L2 level. In this mode, every multicast uses a common virtual IP address for both interfaces. Both interfaces use the same subnet mask and gateway IP address.

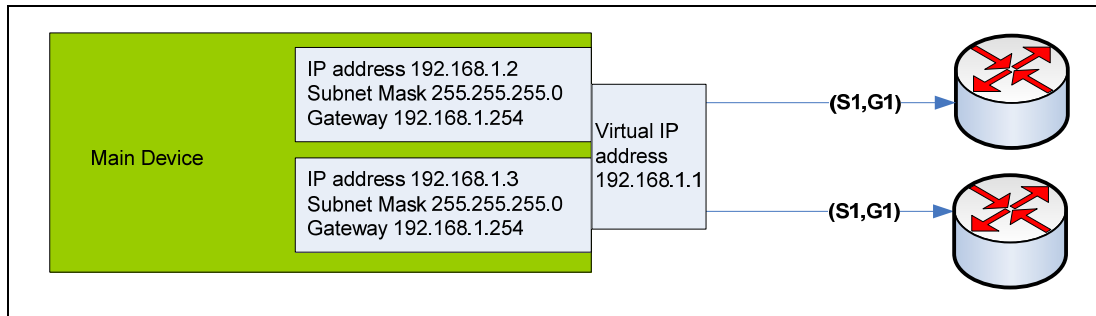


Figure 6.5 Interface Addressing - Same Network Mode

The Internet Group Management Protocol (IGMP) join is made using the physical interface.

Note: Redundant pairs of control interfaces only support same network mode and active/standby mode.

6.4.4 Different Network Mode

In Different Network mode, each multicast output must have a different virtual IP address on the **Ge 3** and **Ge 4** interfaces. The interfaces must be configured with IP addresses that are in different subnets (see the section **Services > Properties > Transport Stream** in *Chapter 5, Web GUI Control*). The subnets used for the primary and secondary network must not overlap, i.e. one must not be a superset of the other.

6.4.5 Active/Active Port Mode

An Active/Active Port Mode can be applied to both input and output data interfaces. In this mode, both interfaces are either transmitting or receiving simultaneously.

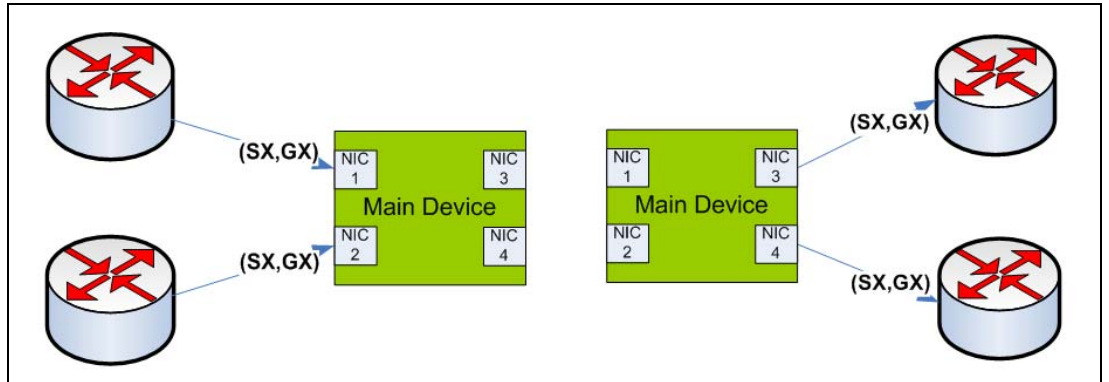


Figure 6.6 Interface Addressing – Active/Active Port Mode

Active/Active interfaces maintain a virtual MAC and virtual IP address at all times. Automatic failover and automatic revert features are not required on Active/Active interfaces.

Note: Input service redundancy can be configured on the input multicast streams even though the input interfaces are in active/active mode. See *Chapter 3, Getting Started* and the section *How to Make a Secondary Input*.

6.4.6

Active/Standby Port Mode

An Active/Standby Port Mode can be applied to the output data interface. In this mode, devices are transmitting or receiving via one interface but not the other. The secondary interface is physically connected but not in use.

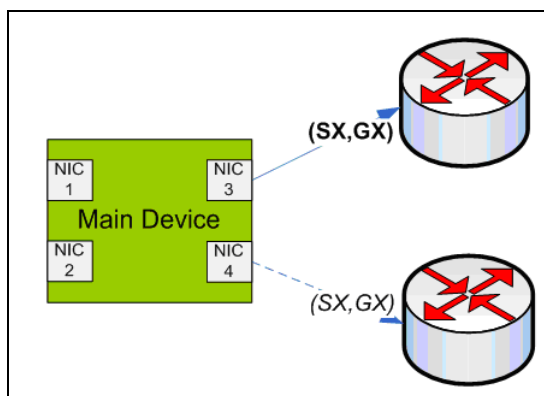


Figure 6.7 Interface Addressing – Active/Standby Port Mode

The virtual MAC and source IP address shall only be accessible via the active interface.

Note: Redundant pairs of control interfaces only support same network mode and active/standby mode.



6.4.6.1 Automatic Failover

Automatic failover is available in Active/Standby Port Mode. If the active interface suffers a link down failure, the standby interface takes over automatically. The standby interface remains active until either the standby interface fails or a manual switch is performed by the user.

6.4.6.2 Automatic Revert

Automatic revert is an option on most devices in **Active/Standby Port Mode**. If the active interface suffers a link down failure, the standby interface takes over automatically if **Auto failover** is selected. If the formally active interface recovers, the device will wait for the configured **Auto revert delay** period and then revert back to the original active interface. Auto revert can be disabled.

6.5 Device Redundancy

6.5.1 Standalone (No Redundancy)

In a Standalone system there is no protection against failure of the device. In the event of a device failure the output profiles will be lost and streaming will be interrupted.

This configuration can only use IP Interface Redundancy, described previously, to provide protection against a network delivery failure.

6.5.2 Dual Active

Dual active means two units running identical configuration and both units are active at the same time. SPR1100 does not currently support automatic mirroring of configuration hence, for dual active operation, both units must be individually configured.

6.5.3 1 + 1 Redundancy

In a 1 + 1 Redundant system, an active **Primary** device is used to deliver the Transport Stream and **Secondary** device is configured as a **Redundant spare** or **Hot standby**.

The configuration settings of each unit are automatically replicated to its peer. Each unit is expected to be connected to the same input and output networks. Each unit will be performing the same transcodes, however only one unit will be **Active**, meaning only one unit will be outputting multicast packets.

Terminology

Primary	The main unit within a 1 + 1 Redundancy group. This unit is normally expected to be Active (broadcasting).
Secondary	The backup unit within a 1 + 1 Redundancy group. This unit is normally expected to be Passive (not broadcasting), but will go Active (start broadcasting) if the Primary unit fails.
Standalone	The Primary unit can also operate in a Standalone role. In this case the Primary will always be Active.
Active	The Active unit is the one that is currently broadcasting. There will normally be exactly one Active unit (although both units can become active under certain circumstances). In this case, the MGP protocol should suppress once of the units output.
Passive	The Passive unit is the unit that is performing transcodes, but not broadcasting. The unit is in a state where it is ready to take over broadcasting.

6.5.3.1 Pairing Primary and Secondary Devices

Pairing is the process of the units in the redundancy group checking that the configuration forms a valid redundancy group, synchronizing state and configuration. On entering the pairing process a unit signals to its peer to also enter the pairing process. The following are checked:

- The role of both units (the roles must be **Primary** or **Secondary** and must not be the same on both units).
- The IP address that the peer has configured for **Peer IP Address**. For a valid configuration the **Peer IP Address** setting on the other unit should refer to this unit's control IP address.

Hardware configuration and software version numbers are also compared. If these do not match an alarm is raised, although the units continue to pair.

If during the pairing process the peer unit cannot be successfully pinged for 30 seconds, then it is assumed that the peer is not available. In this case the unit will become Active.

Once a successful configuration has been established, the Active unit will be determined. For this the current Active state and the previous Active state are used. If the unit has just been powered up, the current active state will be Passive.

- If one of the units is Active and the other is Passive then the Active unit remains Active and the Passive unit remains Passive. The configuration of the Active unit is copied to the Passive unit.
- If both of the units are Active then the **Conflicting Status** alarm is raised, and both units remain Active. A **Configuration Mismatch** alarm is also raised to



indicate that the configuration of the 2 units could not be synchronized automatically.

- If both of the units are Passive then the previous state is examined.
 - If one unit was previously Active and the other unit was previously Passive, then the previously Active unit becomes Active, the previously Passive unit remains Passive, and the configuration is copied from the previously Active unit to the previously Passive unit.
 - If both units were previously Active or both units were previously Passive, then the **Conflicting Status** alarm is raised, and both units remain Passive. A **Configuration Mismatch** alarm is also raised to indicate that the configuration of the 2 units could not be synchronized automatically.

6.5.3.2 Automatic Redundancy Switching

When the Primary is Active an automatic redundancy switch will occur when:

- A critical alarm is present on the Primary and no critical alarm is present on the Secondary for more than the time specified by **Alarm Primary to Secondary Delay**
- The Secondary is unable to ping the Primary for more than the time specified by **Ping Primary to Secondary Delay**

When the Secondary has become active, it will remain active until the operator has cleared the reason for the primary failure and manually requests a revert to the Primary, i.e. there is no **Auto-revert**.

6.5.3.3 Configuration Synchronization

When configuration changes are made to the active unit in a redundancy group they are automatically replicated to the other unit. Physical IP address settings are not replicated between units and must be set independently for each unit. Certain 1+1 redundancy settings must also be set independently on each unit and are not replicated.

Note A web browser window open on the passive unit will not be automatically refreshed, hence the operator must manually refresh this.

It is recommended that the Active unit web GUI is used the majority of the time, with the Passive unit web GUI only used to configure settings unique to the Passive unit.

If a configuration change cannot be replicated on the peer (e.g. due to control network failure), then a **Configuration Mismatch** alarm will be raised on the unit on which the change was made. Once the network problem has been rectified, a manual configuration copy should be performed so that both units are correctly configured.

6.5.3.4 Manual Controls

There are a number of manual controls available. These allow configurations to be copied between units and also allow manual redundancy switches between Primary and Secondary units. The manual controls are intended to be used to resolve conflicts, e.g. configuration changes that were made when the control network connection was lost, or to allow the user to select the active unit in case the pairing process cannot. The manual control is the only way to switch from Secondary to Primary unit.

6.5.3.5 Multicast Guard Protocol (MGP)

If both units become Active, they will both be broadcasting the same multicast to the downstream equipment. This can happen if the control connection between the units is lost (the Secondary thinks the Primary has failed, so goes Active). To prevent this happening, the MGP protection mechanism should be employed. It is recommended that MGP is always enabled when 1 + 1 Redundancy is in use to protect against this scenario.

MGP will prevent one unit broadcasting when another MGP enabled unit is already broadcasting on the same multicast. In the scenario outlined above, MGP will prevent the Secondary broadcasting. The 1 + 1 Redundancy state of the Secondary will still be Active, however the multicast output is suppressed.

6.5.4 Transparent Addressing

Transparent addressing is a method by which all intermediate node addresses are spoofed, so the client and server see each other's addresses and port configurations as if there were no intermediate nodes.

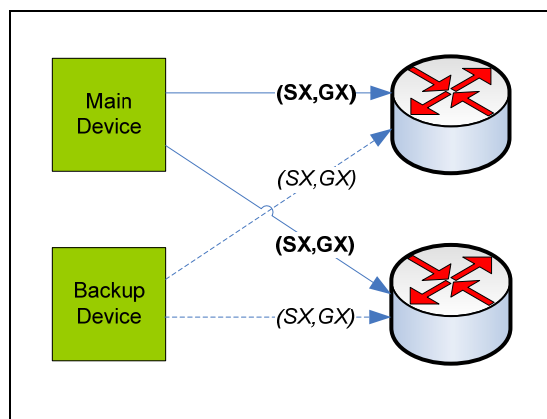


Figure 6.8 Transparent Addressing in Device Redundancy

In normal operation, the main device transmits and the backup device is offline. Main and backup devices will transmit using the same source and destination addresses. Duplicate address protection is provided by either MGP or VLAN control.

The backup device is reconfigured on a redundancy switch. The downstream device does not need to be reconfigured on a redundancy switch.

6.6 A Typical SPR1100 Redundant System

6.6.1 System Architecture

Figure 6.9 shows the Ericsson peripheral components that feed, or are connected to the output of the SPR1100 in a typical system.

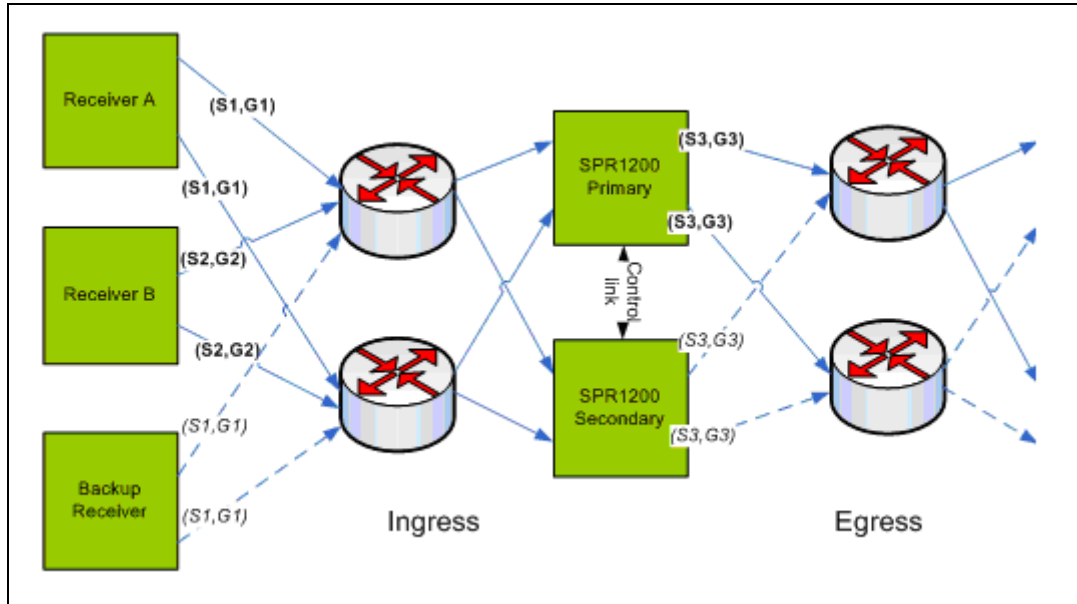


Figure 6.9 Typical SPR1100 System Architecture

This system comprises the following devices using various IP interface redundancy (port configurations) and device level redundancy modes to achieve the system configuration:

- **Receivers:**
 - **IP input redundancy** - Active/Standby, same subnet interfaces.
 - **IP output redundancy** - Active/Active, same subnet interfaces.
 - **Device redundancy** - Transparent addressing in redundancy.

Multicast Guard Protocol (MGP) is used as the protection method against duplicate multicasts in the network. See *MGP* on page 6-24 for further information.

- **Network:** Mirrored with redundant paths isolated from each other.
- **SPR1100:**
 - **IP input redundancy** - Active/Active, same subnet interfaces, IGMP join made on physical interface address.
 - **IP output redundancy** - Active/Active, same subnet interfaces.

- **Device redundancy** - Standalone 1+1 redundancy, transparent addressing in redundancy.

Multicast Guard Protocol (MGP) is used as the protection method against duplicate multicasts in the network. See *MGP* on page 6-24 for further information.

6.6.2 Ethernet Interfaces

All MPEG over IP interfaces should be fixed to Gigabit line speed and full duplex on the SPR and the attached IP switch to avoid negotiation (and a potential speed or duplex change) when on-air.

Interfaces to compression equipment (SPR data interfaces) should be 1000BaseT copper interfaces.

MTU Ethernet size of 1500 (No jumbo frames).

Active/standby output port configuration is supported and in this case a trunk connection between main/backup data switches maybe required.

6.6.3 Multicast Routing

Where Multicast Routing is required, switches must support multicast routing (typical examples are PIM for any source multicast networks, and PIM-SSM for source specific multicast networks. A local RP can be configured (PIM sparse) if data switches are not interconnected (loopback interface for each data switch). Anycast RP can be configured if data switches are interconnected.

Note: There is an advantage on using SSM which is the allocation of less class D addresses assigned to multicast video traffic.

6.6.4 Forwarding Capacity

MPEG over IP traffic usually runs at a constant bit rate, and buffers in the switch must be able to cope with the sustained traffic level.

Ethernet switches should be capable of forwarding at line rate on all interfaces simultaneously. The forwarding capacity should be calculated based on the fact that Ethernet frames are 1316 bytes length (seven 188 MPEG packets per UDP frame), i.e. Switch manufacturers often indicate a forwarding capacity based on shorter Ethernet frame sizes (normally carrying regular TCP data traffic).

6.6.5 IGMP Snooping

Switches must be capable of Internet Group Management Protocol (IGMP) V2 Snooping (filtering by destination address).



Switches must be capable of running an IGMP Querier. Typically the IGMP Querier will be the VLAN with the lowest IP address if both main/backup switches are interconnected through a trunk link (redundant data network – Active/Standby output port configuration).

Switches must be capable of understanding IGMP V3 messages for SSM or ASM.

IGMP V3 Snooping (filtering by source and destination address) is desirable but not mandatory.

6.6.6 Control Network Interfaces

The Control Network must be separate from the TS Data Network and Output Network, MPEG multicasts must not be present on the Control Network.

The Control Network may be run with or without redundant switches.

When redundant switches are provided, the redundant control interfaces on the compression equipment should be used.

6.6.7 MGP

Multicast Guard Protocol (MGP) is designed to protect against duplicate media multicasts. Duplicate media multicasts result in an impact to service quality.

MGP relies on a Multicast Status Message (MSM) to inform a device whether a duplicate media multicast is on the network. The MSM is transmitted in addition to the media multicast by the sending device.

Each MSM contains an identifier that is unique to the sending device. In addition the MSM contains a representation of source IP address(es) and media multicasts it is protecting.

MSMs are transmitted on a UDP multicast that is unique to a media multicast or collection of media multicasts.

Should a redundant device be required to go online it will first transmit and listen for MSMs for the services it has been configured for. By parsing a received MSM, a device can detect duplicate MSMs, since it will have a different unique identifier. This will then indicate a potential duplicate media multicasts. A simple algorithm is then executed to dictate and order of precedence between the two devices.

6.6.8 Common TCP/UDP Port Numbers

Table 6.5 lists port numbers that are typically configured in a system.

Table 6.5 Common TCP/UDP Port Numbers

Port	TCP/UDP	Description
21	TCP	ftp for device upgrades
23	TCP	telnet for control of ASI/SDI routers
80	TCP	http for web control of devices
123	TCP	NTP for time sync
123	UDP	NTP for time sync
161	TCP	SNMP
162	UDP	SNMP traps
1235-1242	TCP	Mux PSI/SI configuration
2443	TCP	Peer SCS
3389	TCP	Remote desktop access to the nCompass server
6400	TCP	Mux configuration
6867	UDP	MGP MSM source and destination ports (default)
6868	UDP	PCR Exchange (Reflex V5)
6869	UDP	M_MUX & M_ENC messages (Reflex V5)
6871	UDP	DSM (default)
6872	UDP	CSM (default)
8400	TCP	Mux configuration
9000	TCP	Mux configuration
Variable		nCompass Remote nClient (uses DCOM to connect)

6.6.9 Example Addressing Scheme

Figure 6.10 shows placement of IP ingress, egress on SPR chassis.

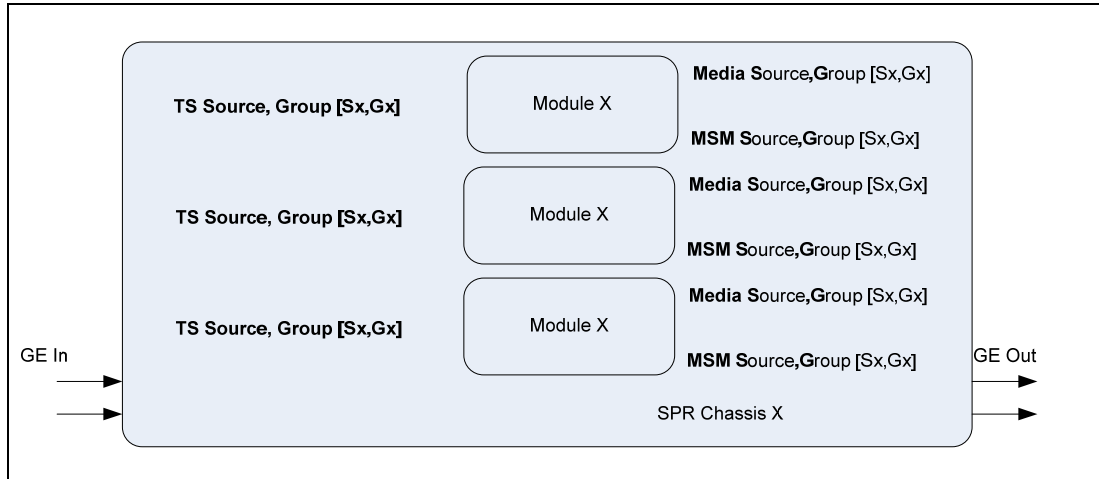


Figure 6.10 Ingress and Egress of SPR

6.7 Temperature Monitoring

Temperatures are reported to the user in degrees Celsius (°C) and degrees Fahrenheit (°F).

6.7.1 Host Card Monitoring

The die temperature of the main components on the Host card are monitored, and reported to an accuracy of ± 2 °C.

A host card temperature alarm threshold can be set that, if exceeded, causes a **System Over Temperature** Alarm to be generated.

6.7.2 Transcoder Module Monitoring

Transcoder modules monitor the die temperature of their main components, and report these temperatures to an accuracy of ± 2 °C. If a transcoder module reports die temperatures, it allows an alarm threshold to be defined for each temperature, which if exceeded causes an alarm to be generated.

6.7.2.1 Media Processing Modules

The controlling processor monitors the core temperatures of the main components and passes this information back to the host card via the back plane for monitoring.

Temperature thresholds can be set to cause a warning or an alarm. The warning level is configurable by the user, whereas the alarm level is hard coded.

6.7.3 Fans

The fans fitted to the chassis are speed controllable, and are a user configurable parameter **fan speed control**.

Table 6.6 Fan Speed Control Settings

Parameter	Setting	Description
Fan speed control	Full speed	The fans run at the configured speed.
	Auto speed	Fan speed is related to the temperatures measured in the chassis.

See *Chapter 8, Preventive Maintenance and Fault finding* for further information.

6.8 Simple Network Time Protocol (SNTP)

The unit can obtain the current time from a network time server using SNTPv4 (RFC 4330) and is capable of working with Microsoft Windows Time, (SNTP as defined in RFC 1767).

6.8.1 Real Time Clock

The Host Controller card has a real time clock, which is battery powered when the chassis is unpowered, so that the time and date is maintained. This clock is designed to be accurate to ± 1 minute per month. The battery is capable of powering the clock for over two years. See *Clock & Timing on page 6-29*.

6.8.1.1 SNTP Time Server

If an SNTP Time Server is selected, and communications are established with it, then the unit uses the time obtained to correct the system's real time clock, and the user cannot set the clock.

If a time server has been configured, but it fails to respond, then an **SNTP Server Failed To Respond alarm** is generated.

An SNTP server can be configured to update the clock and calendar or else the user can update the time and date. Any changes to the time and date are recorded in the system log.

The real time clock is used to set the time and date when the unit is started, but then its own time and date is maintained, unless a change to the time and date parameters occur, when it will be updated to the new settings.

The system can set or correct its system clock from information received from an SNTP Time Server. More specifically it supports SNTP V4 and also Microsoft Windows Time (W32Time), which means that it supports NTP V3.



The user can enter the IP address of the SNMP server to be used, the **default address is 000.000.000.000**, which indicates to the system that no SNMP server has been defined, and therefore SNMP is disabled.

If an SNMP server is defined, and it fails to respond, then an **SNTP Server Timeout** alarm will be raised. This alarm will be de-asserted either when an SNMP response is received, or the SNMP functionality is disabled.

6.9 Simple Network Management Protocol (SNMP)

6.9.1 Supported Protocols

SNMP versions 1, 2c and 3 are supported, primarily for alarm trap handling. The General Ericsson MIB is also supported.

Note: The unit does not support control via SNMP, all remote control is via HTTP or HTTPS.

6.9.2 Operation

The unit's SNMP functionality can be enabled or disabled, with up to five IP addresses assigned for any SNMP Trap message to be sent. The default is 000.000.000.000, which causes the SNMP traps to be sent to the last SNMP master. The SNMP community name can also be set.

The user can control which SNMP traps are generated. The options are;

- Start Messages only
- Fail and Start Messages only
- All Traps

Table 6.7 SNMP Interface Parameters

Parameter	Description
SNMP Read Community	The SNMP community name for read access. default = public
SNMP Location	Textual description of the location of the unit
SNMP Contact	Name of the person responsible for this unit
SNMP Trap Community	The SNMP community name for read access. default = private
SNMP Trap Destination	The destination IP address for SNMP trap messages. Up to five destinations can be defined, but by default none are assigned
SNMP Trap Alarm Level	Defines what events trigger the generation of an SNMP trap

Parameter	Description
	message. The options are: Start Messages Only , i.e. only system start up events. Fail and Start Messages only i.e. start-up events and critical alarms. All traps i.e. start-up events and all alarms and warnings.

6.10 XPO

The unit supports an HTTP/HTTPS interface (see *Appendix B, Technical Specification* for further details) that is XPO2 (the name given to the second generation Ericsson standard for web pages and additional supporting interfaces) compliant for configuration and status monitoring. At least three simultaneous HTTP/HTTPS sessions can be supported. HTTP access can be enabled or disabled.

Individual parameters can be controlled via XPO2. It does not require the complete XML configuration to be sent to change a single parameter.

Note: The legacy XPO standard is not supported.

The web pages provide a service orientated control menu structure.

6.11 Clock & Timing

The Host Controller card has a real time clock, which is battery powered when the chassis is unpowered, so that the time and date is maintained. This clock is designed to be accurate to ± 1 minute per month. The battery is capable of powering the clock for over two years.

6.11.1 User Configurable Parameters

The user configurable parameters associated with the clock are defined below

Table 6.8 Clock Configurable Parameters

Parameter	Values	Description
Local Time	hh:mm:ss	Current local time in hours minutes and seconds
Local Date	dd:mm:yyyy	Current date in day month and year



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Options, Licensing and Upgrades

Chapter 7

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7.1 Introduction

This chapter describes the options that may be used with the Ericsson SPR1100 Stream Processor, and the removal/replacement of options. IT also describes the procedure to follow for obtaining licenses and how to upgrade your unit.

7.2 Media Processing Module - MPM1 HD/SD Transcoder (SPR/HWO/MPM1)

The MPM1 Transcoder Card has a unique processing engine that extracts the maximum efficiency possible from the MPEG-2 and H.264 specifications.

The media processing module is a single slot solution which can transcode multiple MPEG-2 and/or H.264 video streams, at both SD and HD resolutions. Audio pass-through and transcode functionality is also supported.



Figure 7.1 Media Processing Module

The total maximum number of transcodes per module is related to the resolution.

At SD resolution, each MPM1 can perform 12 simultaneous transcodes.

Each transcode involving a HD-resolution stream on input and/or output reduces the number of possible SD transcodes by 3.

Table 7.1 Transcodes

Maximum number of SD-to-SD transcodes	Maximum number of HD transcodes
12	0
9	1
6	2
3	3
0	4

For details of the Video and Audio formats supported, see *Annex B, Technical Specification*.



7.2.1 Inputs and Outputs

The MPM1 has no external inputs or outputs. All data is passed into and out of the module via the internal connectors.

7.2.2 Loss of Video Input

On loss of video input, the MPM1 can be configured to select one of the default test patterns or a freeze frame as the output.

7.2.3 Output Bit Rate

The output rate of the transport packets is derived from the 27 MHz reference clock and is accurate to within 1 kbps of the configured transport bit rate.

The output video bit rate of the MPM1 is configurable within ranges dictated by the operating mode. These ranges are listed in *Annex B, Technical Specification*. The **Configured Video rate** is also known as **Transport Stream rate**.

The module supports bit-stuffing to maintain configured bit rate, if the operating mode requires it.

The output of a module never exceeds the configured bit rate (or bit rate ceiling).

7.2.4 Program Clock Reference

The MPM1 will insert a Program Clock Reference (PCR) in each video stream header.

7.2.5 Transport Packets

The MPM1 supports adaptation field stuffing of transport packets for the alignment of PES packets to transport packet boundaries. Valid continuity counter values are inserted into the transport packet headers.

7.3 Removal and Replacement of Modules

This section gives information relating to the handling of option modules as they are inserted/removed from the unit.

7.3.1 Handling Modules



Caution!

Care must be taken to when inserting or withdrawing modules to avoid damage to underside components.

Modules must be kept orthogonal, i.e. at 90 degrees to the unit, to avoid catching underside components on the chassis.

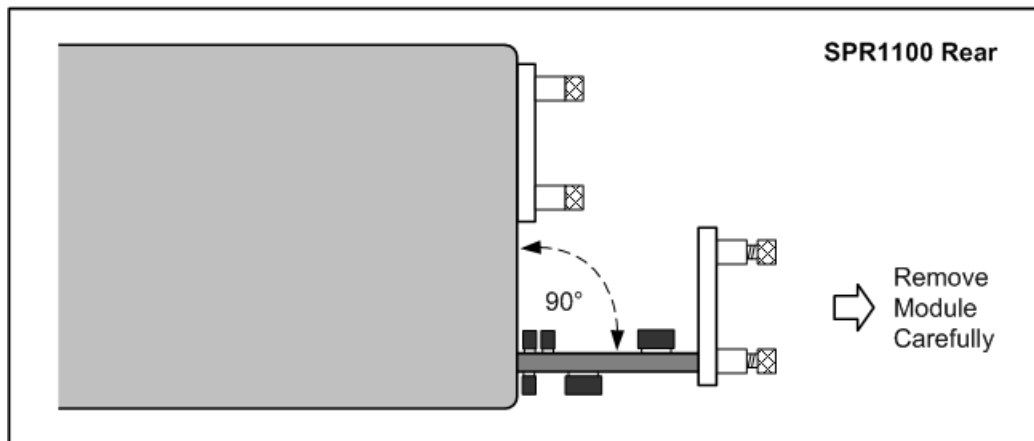


Figure 7.2 Inserting and Withdrawing Modules



Caution!

Do not plug in modules with excessive force as this may result in damage to the module connector or other components. If any significant resistance to inserting a module is felt, withdraw the module slightly and check for obstructions.

7.3.2 Electrostatic Discharge



Warning!

Static electricity can damage electronic components. To avoid damage, keep modules in their static-protective package until you are ready to install them.

To reduce the possibility of electrostatic discharge, observe the following precautions:

- Where possible ensure that antistatic protection is worn (for example an earthed antistatic wrist strap, an ankle or heel strap).



- Handle modules carefully, holding it by its edges or its rear panel.
- Do not touch solder joints, pins, or exposed printed circuitry.
- Do not leave the modules where others can handle and possibly damage them.
- While the module is still in its anti-static package, touch it to an unpainted metal part of the system unit for at least two seconds. (This drains static electricity from the package and from your body.)
- Remove the module from its package and install it directly into your base chassis without setting it down. If it is necessary to set the module down, place it in its static-protective package.
- Take additional care when handling modules during cold weather, because heating reduces indoor humidity and increases static electricity.

7.3.3

Installing a New Module

A new module can be inserted when the unit is powered off or on. When inserted and powered, the unit will determine the module capabilities and make it available for configuration. Initially a default set of parameters will be in place. As long as there are licenses available for the features required, the module can then be configured and used immediately.



Caution!

To avoid damaging the module, always handle carefully (see *section 7.3.1*) and avoid electrostatic discharge (see *section 7.3.2*).

To install a new module:

1. Remove the blanking plate from the module slot in which the new module is to be fitted.
2. Carefully remove the new module from its anti-static package, and insert it in to the base unit, slotting the module edges in to the module guides.
3. Push the module home, so that the rear panel is flush with the rear of the base unit.
4. Tighten the two captive retaining screws.
5. When the unit detects that a new module has been fitted, it will be displayed on the **Modules** pane of the **Configure > Services** web page, and an alarm will be raised. If all options are reported correctly, select the **Allow reallocation of all services** option from the **Action** drop-down menu in the **Modules** panel. This will accept the new hardware configuration and clear the alarm.

7.3.4 Removing a Module



Caution!

To avoid damaging the module, always handle carefully (see *section 7.3.1*) and avoid electrostatic discharge (see *section 7.3.2*).

To remove a module:

1. Loosen the two captive screws that retain the module in the base unit.
2. Holding the captive screws, pull the module from the unit and place it in suitable anti-static packaging.
3. Fit a blanking panel in place of the removed module.
4. When the unit detects a module is no longer present, it will be displayed on the **Modules** pane of the **Configure > Services** web page, and an alarm will be raised. Select the **Allow reallocation of all services** option from the **Action** drop-down menu in the **Modules** panel. This will accept the new hardware configuration and clear the alarm.

7.3.5 Replacing (Hot-Swapping) a Module

A module can be replaced without powering down the base unit, i.e. can be hot-swapped. This will cause services to be allocated to other modules, enabling the removal of the module in question. In this way, essential maintenance can be carried out with minimum disruption. To perform a hot-swap, the modules should only be unplugged or inserted when the unit is fully booted and configured.

Only ONE module should be hot-swapped at a time, to prevent problems due to inrush current, and to ensure that the host recognizes and configures the new module. If more than one module is being fitted, a wait time of approximately 10 s is recommended between inserting each module.



Caution!

To avoid damaging the module, always handle carefully (see *section 7.3.1*) and avoid electrostatic discharge (see *section 7.3.2*).

To replace (hot-swap) a module:

1. On the **Modules** pane of the **Configure > Services** web page, select the **Allow reallocation of all services** option from the **Action** drop-down menu in the **Modules** panel.

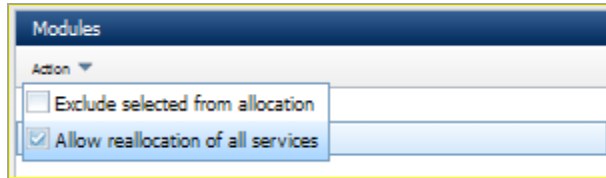


Figure 7.3 Modules Pane - Reallocation

2. Change the exclusion settings for the module by selecting the module and selecting **Exclude selected from allocation** from the **Action** drop-down menu. Alternatively, right-click that module and select the same option from the displayed menu.

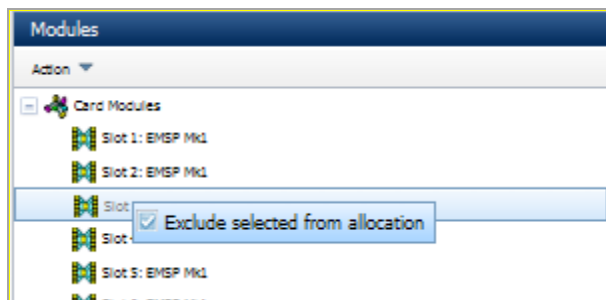


Figure 7.4 Modules Pane – Exclusion

3. Loosen the two captive screws that retain the module in the base unit.
4. Holding the captive screws, pull the module from the unit.
5. Carefully remove the replacement module from its anti-static package, and insert it in to the base unit, slotting the module edges in to the module guides.
6. Push the module home, so that the rear panel is flush with the rear of the base chassis.
7. Tighten the two captive retaining screws.

Note: If the replacement module is of the same type as the failed module, then it will be automatically configured to the same settings as the failed module. If the replacement module is of a different type then an alarm will be generated.

The unit regularly monitors to verify module presence and to detect if a module has been removed or added.

When a new module is inserted it will start-up and attempt to link to the host controller. When this link has been established the process of identifying the module and its capabilities begins. Once this is established, the module will be configured with the same configuration as the module that has been replaced (assuming that the replacement module has the same capabilities).

7.4 Obtaining New Licenses

The functionality of the SPR1100 depends on the hardware options fitted and the software options installed. Software options are enabled or disabled by means of license keys. A license key is a string of numbers which, when downloaded to a unit, will enable a specific feature or feature set.

License keys can be purchased from your local Ericsson sales representative. License keys may be installed by the user, allowing field upgrading of units to be performed simply.

7.4.1 Installed Licenses

The unit comes with the option cards and licenses, which were ordered, already installed.

All licenses are stored on the host.

7.4.2 Verifying Which Licenses Are Present in the Unit

Access to the web pages is necessary to verify the licenses that are enabled on the unit.

Navigate to **Support > Licenses**. This page displays a tab for each card that contains licenses. Each tab contains the marketing code, number of each license and a description of the feature enabled by the license.

Note: Short term licenses are not supported.

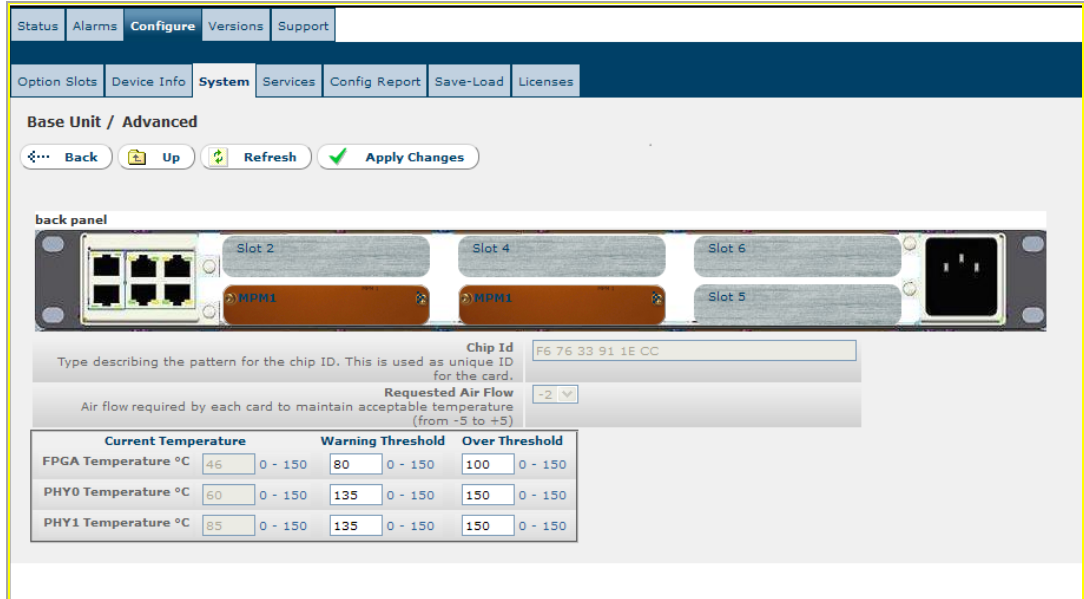
The number of licenses can be extended and new licenses ordered after the unit has been shipped.

To get and upload additional licenses, proceed as follows.

7.4.3 Ordering Additional Licenses

When ordering additional licenses for existing units the following information is needed:

- **Unique Chip ID of the unit** to enable licenses stored on the base chassis. To retrieve the Chip ID, go to **Base Unit > Advanced** tab.



Base Unit / Advanced

back panel

Slot 2 Slot 4 Slot 6

MPM1 MPM1

Slot 5

Chip Id F6 76 33 91 1E CC

Type describing the pattern for the chip ID. This is used as unique ID for the card.

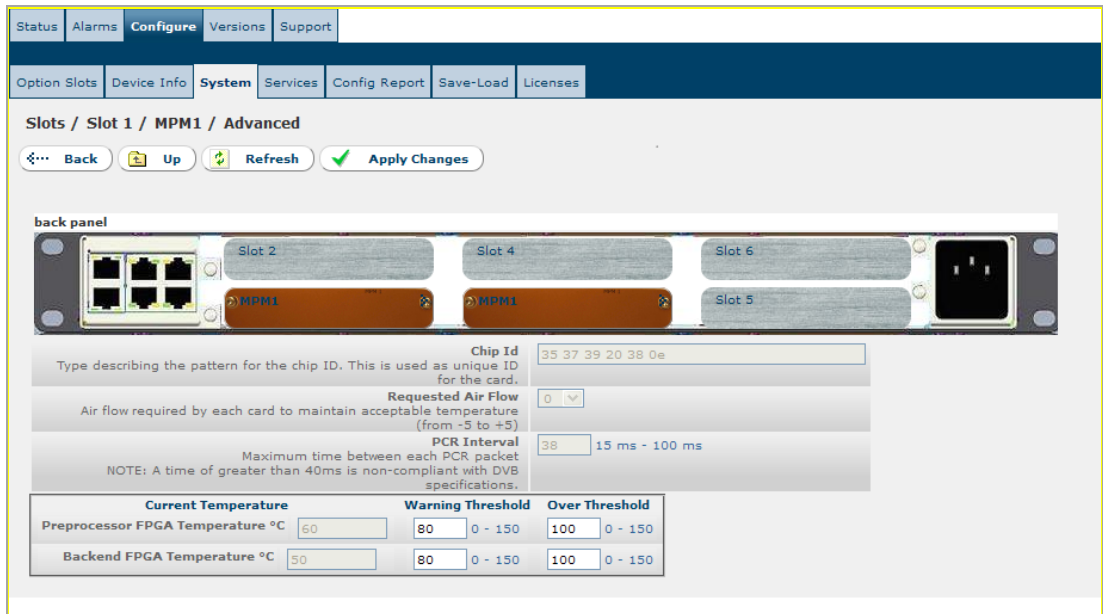
Requested Air Flow -2

Air flow required by each card to maintain acceptable temperature (from -5 to +5)

	Current Temperature	Warning Threshold	Over Threshold
FPGA Temperature °C	46 0 - 150	80 0 - 150	100 0 - 150
PHY0 Temperature °C	60 0 - 150	135 0 - 150	150 0 - 150
PHY1 Temperature °C	85 0 - 150	135 0 - 150	150 0 - 150

Figure 7.5 Finding the Host Card Chip ID for License Generation

- The unique Chip ID of the option card to enable licenses stored on the card. To retrieve the Chip ID, go to **Slots > Slot N > MPM1 > Advanced**.
- The corresponding slot number MUST also be provided.



Slots / Slot 1 / MPM1 / Advanced

back panel

Slot 2 Slot 4 Slot 6

MPM1 MPM1

Slot 5

Chip Id 35 37 39 20 38 0e

Type describing the pattern for the chip ID. This is used as unique ID for the card.

Requested Air Flow 0

Air flow required by each card to maintain acceptable temperature (from -5 to +5)

PCR Interval 38 15 ms - 100 ms

Maximum time between each PCR packet

NOTE: A time of greater than 40ms is non-compliant with DVB specifications.

	Current Temperature	Warning Threshold	Over Threshold
Preprocessor FPGA Temperature °C	60 0 - 150	80 0 - 150	100 0 - 150
Backend FPGA Temperature °C	50 0 - 150	80 0 - 150	100 0 - 150

Figure 7.6 Finding the Option Card Chip ID for License Generation

- The **TOTAL FINAL** number of licenses required (including licenses already enabled on the unit) needs to be provided.

Based on the above information, a license key file will be generated and provided to the customer.

7.4.4 Entering License Keys

The keys are saved in an XML (e.g. newlicensedetail.xml) ready to be entered onto the unit via the web page.

1. Open **Support > Licenses**. Click the **Browse** button to locate the license key file.
2. Click on the **Upload** button.
3. If licenses are required for both the base chassis and VCM option card then multiple files will be provided which all need to be loaded onto the specific unit.
4. Reboot the unit for the changes to take effect.

Note: The front panel CANNOT be used to upload license keys.

7.5 Installing Software and Firmware Upgrades

New software and firmware versions for your SPR1100 unit may be supplied, enabling you to upgrade your unit(s) to install bug fixes or add new functionality.

To install a firmware upgrade:

1. Contact your Ericsson representative and specify the upgrade required plus the serial numbers of your unit(s). This may be obtained by pressing the **About** button at the top right-hand corner of any web GUI page to display a dialog listing details about the unit, see **Error! Reference source not found..**
2. Your upgrade will be supplied as an EXE file. This is a wizard that will guide you through the installation procedure.
3. Save the file to your computer.
4. Run the EXE file (by double-clicking on it) and follow the on-screen instructions to install the upgrade.

In the event of a failed upgrade, please contact Customer Support for assistance.

7.6 Installing a Patch File

Software patches may be supplied for customer-specific issues, allowing you to rectify problems or add specific features.

To install a patch:

1. Your patch file will be supplied as a viper file.
2. Save the file to your computer.



3. From the web GUI, open the **Configure > Save-Load** page (See *Chapter 5, Web Control* for details of this page). **Browse** to the key file and then **Upload** the file to the unit.

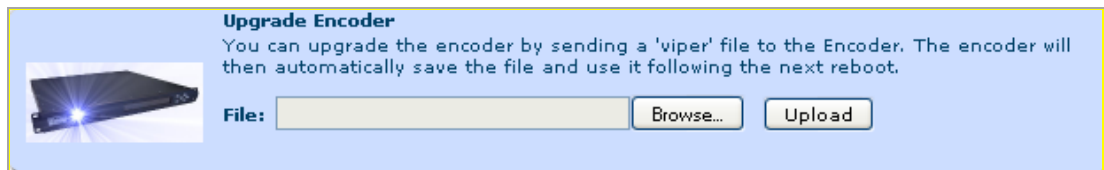


Figure 7.7 Uploading a Patch File

4. Reboot your unit to activate the new software/firmware.
5. From the web GUI, open the **About** page and check that the software/firmware version number now appears on the **About** dialog.

In the event of a failed upgrade, please contact Customer Support for assistance.



Preventive Maintenance and Fault-finding

Chapter 8

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8.1 Introduction

This chapter details the schedules and instructions, where applicable, for routine inspection, cleaning and maintenance of the equipment which should be performed by an operator. It also details basic fault-finding procedures, software and firmware upgrade procedures and disposal information.

8.2 Preventive Maintenance

8.2.1 Routine Inspection

Check cooling fan operation regularly. The fans are temperature controlled so may not be on if the ambient temperature is low. Refer to *Technical Specification* for more information.

Note: Failure to ensure a free flow of air around the unit may cause overheating. This condition is detected by a temperature sensor on the Host Card or an MPM and causes the alarm to be raised. See *Section 8.5.3.1*, for further information.

8.2.2 Cleaning



Caution!

Do not use liquid cleaners or aerosol cleaners.

Unplug the unit from the wall outlet before cleaning the exterior with a damp cloth. Do not use liquid cleaners or aerosol cleaners.

Note: Only the exterior of the case should be cleaned.

8.2.3 Servicing

8.2.3.1 Damage Requiring Service



Warning!

Do not remove the covers of this equipment. Hazardous voltages are present within this equipment and may be exposed if the covers are removed. Only Ericsson trained and approved service engineers are permitted to service this equipment.

Unplug the equipment from the wall outlet and refer servicing to qualified service personnel under the following conditions:



- When the power supply cord or plug is damaged.
- If liquid has been spilled, or objects have fallen into the product.
- If the product has been exposed to rain or water.
- If the product does not operate normally by following the operating instructions.
- If the product has been dropped or the case has been damaged.
- When the product exhibits a distinct change in performance.

8.2.3.2 Replacement Parts

When replacement parts are required, be sure the service technician has used parts specified by the manufacturer or which have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock or other hazards.

8.2.3.3 Checks on Completion of Servicing

Upon completion of any service or repairs to this product, ask the service technician to perform electrical safety checks to determine that the product is in a safe operating condition. Also, performance and EMC checks may be required.

8.3 Maintenance and Support

8.3.1 Introduction

Ericsson is a leader in the design, integration and implementation of digital broadcasting products and systems. It has a large team dedicated to keeping our customers on-air 24 hours a day, 365 days a year.

With regional offices worldwide, and ultra-modern specialist service facilities in the US, UK, and Asia, Ericsson covers the world. There is a customer service centre open round the clock, every day of the year.

Years of design and support experience enable it to offer a range of service options that will meet your needs at a price that makes sense.

8.3.2 Warranty

All Ericsson products and systems are designed and built to the highest standards and are covered under a comprehensive 12 month warranty.

8.3.3 Levels of Continuing Ericsson Service Support

For standalone equipment, then Ericsson **BASIC Essential support** is the value for money choice for you. **BASIC** provides you with year-by-year Service long after the warranty has expired.

For systems support you can choose either **Gold Business Critical** support or **Silver Business Advantage**. These packages are designed to save you costs and protect your income through enlisting the help of Ericsson support specialists.

Call Ericsson Sales for more details.

8.4 Alarms

The SPR1100 reports any detected error condition by generating an alarm event. Alarms are reported in several ways:

- Front panel alarm status LED – indicates the most recent and highest level alarm event. Displays **red** (CRITICAL FAILURE), **amber** (ERRORS) or **green** (OK). See *Chapter 1, Introduction* for details.
- Front panel LCD **System > Alarms** page - lists the currently active alarms. See *Chapter 4, Front Panel Control* for details.
- Web GUI **No Alarm/Alarm** summary Indicator – indicates the most recent and highest level alarm event. Displays **red** (CRITICAL FAILURE), **amber** (ERRORS) or **green** (OK). When clicked, a pop-up dialog shows details of the alarm. See *Figure 8.1*, and *Chapter 5, Web GUI Control* for details.
- Web GUI **Alarms** tab page – lists all current alarm events, provides a history of all previous alarm events and enables alarm severity modification and masking. Every alarm event type is assigned a severity level by default: **masked**, **warning**, **minor**, **major**, or **critical**. See *Chapter 5, Web GUI Control* for details.
- Generation of SNMP traps.

Alarm level severity is set by default but may be modified by the user using the **Alarms > Current** tab page on the Web GUI. See *Chapter 5, Web GUI Control* for details.

Time	Severity	Name	Module	Slot	Port
Tue Aug 04 12:46:48 1970	Major	Video 1 Input PCR	Video 1	Slot 1	1
Mon Aug 03 23:32:54 1970	Major	Ethernet interface Ctrl2 link down on Control network	Base Unit	Host	6
Tue Aug 04 15:30:33 1970	Major	Ethernet interface Data3 in Data Interface Group 3-4: duplicate IP detected	Base Unit	Host	3
Mon Aug 03 23:32:57 1970	Major	Ethernet interface Data4 link down in Data Interface Group 3-4	Base Unit	Host	4
Mon Aug 03 23:32:54 1970	Major	Ethernet interface Data2 link down in Data Interface Group 1-2	Base Unit	Host	2
Mon Aug 03 23:32:54 1970	Critical	HW Configuration Mismatch in slot	Base Unit	Slot 1	0
Mon Aug 03 23:32:54 1970	Critical	HW Configuration Mismatch in slot	Base Unit	Slot 2	0
Mon Aug 03 23:32:57 1970	Critical	HW Configuration Mismatch in slot	Base Unit	Slot 3	0
Mon Aug 03 23:32:57 1970	Critical	HW Configuration Mismatch in slot	Base Unit	Slot 4	0
Mon Aug 03 23:32:57 1970	Critical	HW Configuration Mismatch in slot	Base Unit	Slot 5	0
Mon Aug 03 23:32:57 1970	Critical	HW Configuration Mismatch in slot	Base Unit	Slot 6	0

Figure 8.1 Current Alarm List

Table 8.1 Alarm Levels

Alarm	Color	Description
Masked	Green	Any change of state of the alarm is logged, but no further action is taken.
Warning	Yellow	Any change of state of the alarm is logged. The alarm is reported on the Alarms > Current tab page. An SNMP trap may optionally be generated for Warnings.
Minor	Yellow	Any change of state of the alarm is logged. The alarm is reported on the Alarms > Current tab page. An SNMP trap may optionally be generated for Minor alarms.
Major	Orange	Any change of state of the alarm is logged. The alarm is reported on the Alarms > Current tab page. An SNMP trap is generated.
Critical	Red	Any change of state of the alarm is logged. The alarm is reported on the Alarms > Current tab page. An SNMP trap is generated. A control system will assume that the associated MPM has failed, and will perform a card level redundancy switch.

Note: If alarms are masked, they will not be displayed on any of the reporting interfaces, and will not produce an SNMP trap message.

The **Alarms > History** tab on the web GUI maintains a history of all changes of alarm states. In the event of problems with your unit, it may be worth investigating the sequence of alarms that have been generated in order to isolate the origin of the problem.

See *Annex E, Alarm Lists* for further details of possible alarm messages.

8.5 Fault-finding

8.5.1 Fault-finding Philosophy

It is the objective of this section to provide sufficient information to enable you to rectify apparent faults or else to identify the suspect module, where possible. Some basic procedures are provided to follow in the event of a suspected failure. It is assumed that fault-finding has already been performed at a system level and that other equipment units have been eliminated as the possible cause of the failure.



Warning!

Do not remove the covers of this equipment. Hazardous voltages are present within this equipment and may be exposed if the covers are removed. Only Ericsson trained and approved service engineers are permitted to service this equipment.



Caution!

Do not remove the covers of this equipment. Unauthorised maintenance or the use of non-approved replacements may affect the equipment specification and invalidate any warranties.

This Reference Guide does not include any maintenance information or procedures that would require the removal of covers.

If the following information fails to clear the abnormal condition, call a Service Engineer or contact Customer Services using the information given in the preliminary pages of this Reference Guide.

8.5.2

Preliminary Checks

Always investigate the failure symptoms fully, prior to taking remedial action. Fault diagnosis for the equipment operator is limited to the following tasks, since the operator should **NOT** remove the covers of the equipment:

1. Check the front panel and web GUI alarm indications to specify the nature of the fault.
2. Confirm that the equipment hardware configuration is suitable for the purpose and has been correctly installed and connected (see *Chapter 2, Installing the Equipment*).
3. Confirm that inappropriate operator action is not causing the problem, and that the equipment software set-up is capable of performing the task being asked of it. If the validity of the configuration, set-up or operation is in doubt, check it (see *Chapter 5, Web GUI Control*).
4. Check that the fans are unobstructed and working correctly.

When the failure condition has been fully investigated, and the symptoms are known, proceed with fault-finding according to the observed symptoms. If the fault persists, and cannot be rectified using the instructions given in this Reference Guide, contact Customer Services. Switch off the equipment if it becomes unusable, or to protect it from further damage.

8.5.3 Power Supply Problems/Unit Not Working

If the unit Status LED is unlit, fault-find the problem as detailed in *Table 8.2*.

Table 8.2 Status LED Unlit Fault-finding

Step	Action	If Result of Action is Yes...	If Result of Action is No...
1	Confirm Status LED. Is the unit working but the display inactive?	If the unit is clearly working normally then the front panel may be at fault. Call a Service Engineer.	Proceed to next step.
2	Check Power Source. Connect a known-working piece of equipment to the power source outlet. Does it work?	The problem lies within the unit or power cable. Proceed to next step.	The problem lies with the power source. Check building circuit breakers, fuse boxes, etc. If problem persists, contact the electricity supplier.
3	Check Power Cable and Fuse. Unplug the power connector from the unit and try it in another piece of equipment. Does it work?	The problem lies within the unit. Proceed to next step.	The problem lies with either the cable itself, or with the fuse in the plug. Replace the fuse or try to substitute another cable.
4	Check PSU Module(s) and Fuse(s). Ensure the power connector is unplugged. Remove the fuse from the rear panel connector and inspect it. Has the fuse blown?	Replace the fuse with one of the correct type and rating (see <i>Annex B Technical Specification</i>). If the PSU still does not work, unplug the power cable and call a Service Engineer.	Possible problem with the PSU module. Call a Service Engineer.

8.5.3.1 Fuse Replacement

Fuses are held in integral fuse carriers at the AC power inlets at the rear panel.

Note: Refer to *Technical Specification* for more information about the fuse.



Warning!

Before replacing the rear panel fuses, disconnect the unit from the supply. Failure to do this may expose hazardous voltages. Unplug the unit from the local supply socket.

To replace the AC power fuse(s):

1. Ensure the power is turned off and the power cable is disconnected from the AC power inlet(s).
2. Ease out the fuse carrier by placing a small, flat-bladed screwdriver in the notch at the top of the carrier.



Caution!

When replacing the power input fuses, always ensure that a fuse of the correct type and rating is fitted. Failure to do so results in inadequate protection.

3. Replace the fuse in the carrier.
4. Insert the fuse carrier back in the AC power inlet.

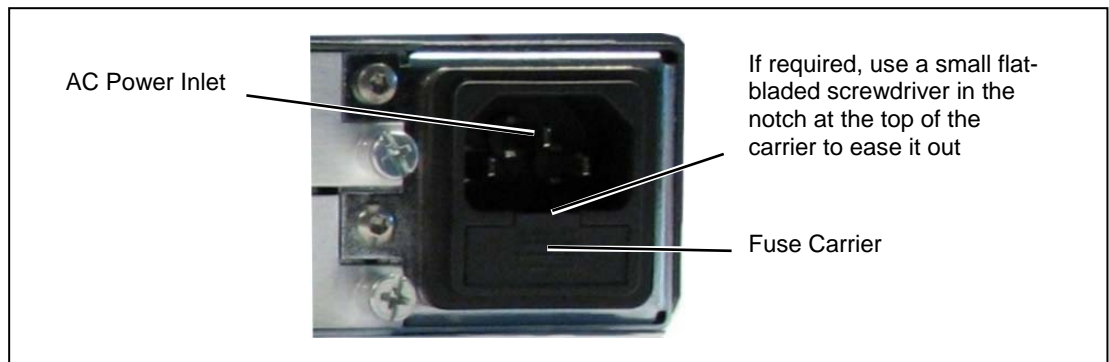


Figure 8.2 Position of Fuse Carrier

If the replacement fuse also blows, do not continue. Disconnect the equipment and contact Customer Services for advice.

8.5.3.2 Lithium Battery

The lithium battery fitted within this product is not user replaceable and as such should only be replaced by qualified service personnel.

8.5.4 Fan(s) Not Working/Overheating

The fans can be disabled at low temperatures to allow the unit to quickly attain operational temperature. In the event of overheating problems, refer to *Table 8.3*.

Note: Failure to ensure a free air-flow around the unit may cause overheating. This condition is detected by a temperature sensor; it may be used to trigger an automatic alarm.

Table 8.3 Fans Not Working/Overheating

Step	Action	If Result of Action is Yes...	If Result of Action is No...
1	Check Fan Rotation. Inspect the fans located at the sides of the enclosure. Are the fans rotating? Check Base Board temperature and fan.	Check that the unit has been installed with sufficient space allowed for air-flow (see <i>Chapter 2, Installing the Equipment</i>). If the ambient air is too hot, additional cooling may be required.	Possible break in the DC supply from the PSU module to the suspect fan(s). Call a Service Engineer.

8.5.5 Cannot Access Web GUI

In the event that you cannot access the SPR1100 web GUI, refer to *Table 8.4*.

Table 8.4 Cannot Access Web GUI

Step	Action	If Result of Action is Yes...	If Result of Action is No...
1	Check IP Connectivity. Ping the SPR1100 from another device on the same IP subnet using the device command prompt. Does the unit return the ping?	Ensure you are using an appropriate browser. See <i>Chapter 5, Web GUI Control</i> for details. Proceed to next step.	Check you have the correct IP address. See <i>Cannot Ping the SPR1100</i> , below.
2	Check other SPR1100 web GUIs or websites. Does the browser access other IP addresses?	There is a problem with the SPR1100. Proceed to next step.	There is a problem with the computer you are using to access the network, or with the network.
3	Restart the SPR1100. Can you access the web GUI now?	Check your configuration. You may need to reload a saved configuration to restore your system.	Possible problem with the SPR1100. Call a Service Engineer.

8.5.6 Communications (Control Port/Data Port) Alarms

The control ports can raise an alarm during abnormal operational conditions.



Table 8.5 Control Ports Alarms

Alarm	Description
Ctrl x: Link Down	No link has been established on this Ethernet Control Port.
Ctrl x: Duplicate Control IP Address Detected	Another device has responded to an ARP request for this Control port IP address.

The data ports can raise an alarm during abnormal operational conditions.

Table 8.6 Data Ports Alarms

Alarm	Description
Data x: Link Down	No link has been established on this Ethernet Data Port.
Data x: Duplicate IP Address	Duplicate IP Address Detected; Another device has responded to an ARP request for the IP address of this port.

8.5.7

Cannot Ping the SPR1100

'Pinging' a computer is a way to check and see if a computer is on the network. Pings send a network request to a computer asking it to respond (ICMP ECHO_REQUEST).

To ping a computer from a Windows/PC machine, use the MSDOS prompt and type the command: **ping <IP address>**

A successful 'ping' consists of receiving back a copy of a short transmitted test message. The reply will display 'ping statistics' (number of packets sent and received and the time taken, in ms, to receive back those packets).

In the event that you cannot ping your SPR1100 unit, refer to *Table 8.7*.

Table 8.7 Cannot Ping the SPR1100

Step	Action	If Result of Action is Yes...	If Result of Action is No...
1	Check Connection at back of PC. Is the network connection connected and active?	Possible network or SPR1100 problem. Proceed to next step.	Change port/replace cable, if necessary, and check network settings.
2	Check Connection at back of SPR1100. Is the network connection connected and active?	Possible network problem. Proceed to next step.	Change port/replace cable, if necessary, and check network settings.



Step	Action	If Result of Action is Yes...	If Result of Action is No...
3	Check network switch operation. Is the network switch connected and active?	Possible network problem. Proceed to next step.	Change port/replace cable/replace network switch, if necessary, and check network settings.
4	Check network operation. Ping other devices on the same IP subnet using the device command prompt. Can you ping other devices?	Network is operational. Possible SPR1100 problem. Call a Service Engineer.	Possible problem with IP switch, router or network. Contact your network administrator.

8.5.8 Configuration Problems

In the event that you have configuration problems, refer to *Table 8.8*.

Table 8.8 Configuration Problems

Step	Action	If Result of Action is Yes...	If Result of Action is No...
1	Check configuration settings. Is your configuration workable?	Proceed to next step.	Adjust settings, if necessary, using Configure > Services web page. Make sure to click the Apply All button after making any changes.
2	Check MPM health and allocation of resources. Have you got enough MPMs fitted and operational?	Proceed to next step.	Install more MPMs or try re-allocating resources and re-check using the Modules pane on the Configure > Services web page.
3	Check configuration file. Have you made any recent changes to the configuration?	Upload a backup (previously saved) configuration file, or upload one from another unit performing a similar function, using the Restore Standard Configuration From File option on the Configure > Save-Load web page. If this fails to restore operation, call a Service Engineer.	

8.5.9 MPM1 Transcoder Card Alarms

8.5.9.1 Alarm Handling

The MPM1 Transcoder Card provides the following alarms back to the Host card:

- Loss of video (from any source)



- Loss of audio (from any source)
- Loss of VBI data
- Invalid Parameter (indicating which area video/audio/VBI/ANC data)
- Critical alarm (card has malfunctioned, internal log holds nature of failure)
- Over temperature (including a warning level as well as an critical level)

All masking of alarms is handled by the Host card.

8.5.9.2 Self-monitoring

The MPM1 endeavors to self monitor itself for correct operation and correct any inconsistencies it finds. This includes the resetting of malfunctioning sub-systems or the whole card if necessary. The module attempts to maintain correct operation to minimize the effects of faults. All such actions are reported through the alarms/status/logging back to the host card.

8.5.9.3 Module Responses

The Host card monitors all responses back from the module and resets the module if appropriate. This includes initiating redundancy switches if this results in limiting the error period. All actions are logged by the Host card.

8.5.9.4 Manual Response to Alarms

Certain alarm conditions will require manual intervention from the user. This may occasionally mean the need to know which MPM1 encoder card is performing the transcode of any particular service.

To assist the user, the Ericsson SPR1100 has a Configuration Report page. This allows the user to see the mapping of services to cards.

8.6 SNMP Traps

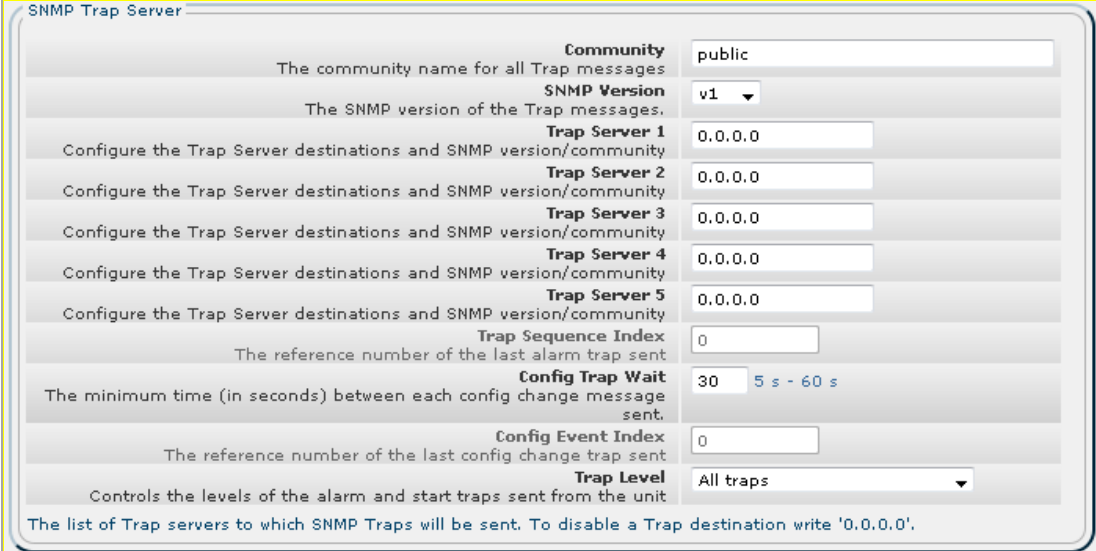
8.6.1 What Is An SNMP Trap?

This feature enables a management station to be notified of significant events (including alarm events) by sending an SNMP message to a specified IP address. If you have a large number of devices, it may be impractical to poll or request information from every device. This feature enables each 'agent' on the managed device to notify the manager without solicitation. It does this by sending a message known as a 'trap' of the event.

When the SNMP trap is received, the management station displays it and the manager can choose to take an action based on the event, perhaps by polling the agent directly, or by polling other associated device agents to obtain a better understanding of the event. Trap-directed notification can result in substantial savings of network and agent resources by eliminating the need for numerous SNMP requests.

8.6.2 Using SNMP Traps

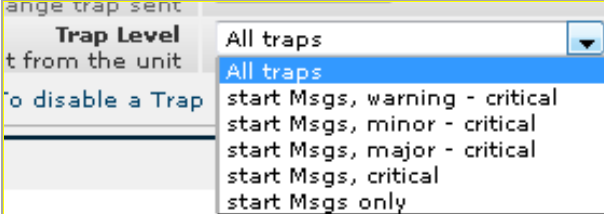
SNMP functionality on the SPR1100 is enabled or disabled using the web GUI **Configure > System > SNMP** web page. Up to five IP addresses can be assigned for any SNMP trap message to be sent. The default is 000.000.000.000, which causes SNMP traps to be sent to the last SNMP master. See *Chapter 5, Web GUI Control* for details of this function.



The screenshot shows the 'SNMP Trap Server' configuration page. It includes fields for 'Community' (public), 'SNMP Version' (v1), and five 'Trap Server' IP addresses (all 0.0.0.0). It also has 'Trap Sequence Index' (0), 'Config Trap Wait' (30 seconds), 'Config Event Index' (0), and 'Trap Level' (All traps). A note at the bottom states: 'The list of Trap servers to which SNMP Traps will be sent. To disable a Trap destination write '0.0.0.0'.'

Figure 8.3 SNMP Trap Server Specification

From this web page you can set other SNMP control parameters, including which SNMP traps are generated, see *Figure 8.4*.



The screenshot shows a dropdown menu for 'Trap Level'. The options are: 'All traps', 'start Msgs, warning - critical', 'start Msgs, minor - critical', 'start Msgs, major - critical', 'start Msgs, critical', and 'start Msgs only'.

Figure 8.4 SNMP Trap Levels

The list of currently active alarms can also be accessed via the front panel. The list of SNMP IP Addresses can also be accessed via the **Config > Device Info** web page.

8.6.2.1 Supported Protocols

SNMP versions 1, 2c and 3 are supported, primarily for alarm trap handling. The General Ericsson MIB is also supported.

Note: The unit does not support control via SNMP, all remote control is via HTTP or HTTPS.

8.6.2.2 SNMP Interface Parameters

Table 8.9 SNMP Interface Parameters

Parameter	Description
SNMP Read Community	The SNMP community name for read access. default = public
SNMP Location	Textual description of the location of the unit
SNMP Contact	Name of the person responsible for this unit
SNMP Trap Community	The SNMP community name for read access. default = private
SNMP Trap Destination	The destination IP address for SNMP trap messages. Up to five destinations can be defined, but by default none are assigned
SNMP Trap Alarm Level	Defines what events trigger the generation of an SNMP trap message. The options are: Start Messages Only , i.e. only system start up events. Fail and Start Messages only i.e. start-up events and critical alarms and All traps i.e. start-up events and all alarms and warnings.

8.7 Viewing Log Files

The event log is stored on the unit Host Controller Card (HCC). A log file is generated with a file format as defined by RFC3164. When the log has filled the space allocated to it, the oldest entries in the log file are over-written.

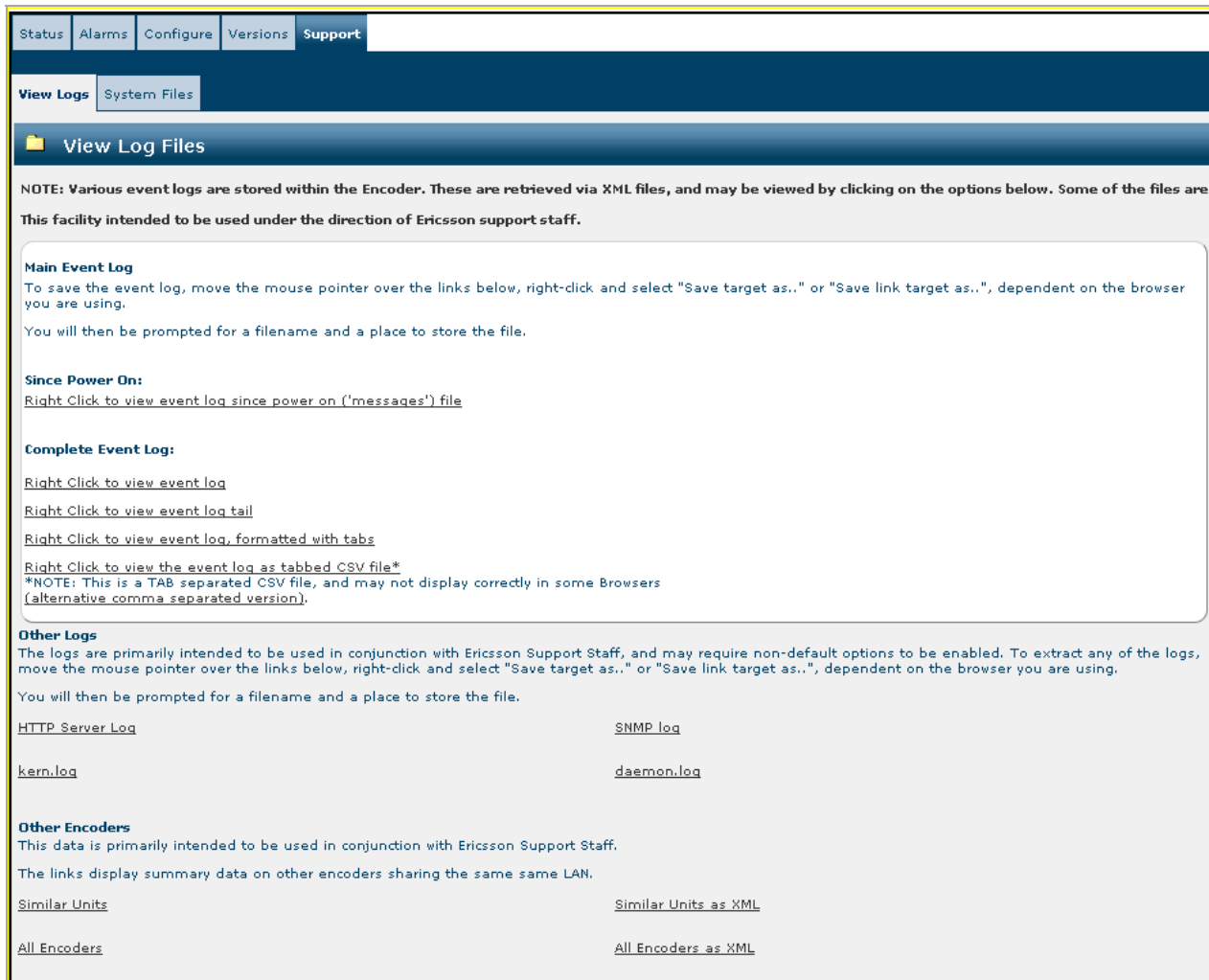
Logged events include power-on, power on self test (POST) results, warning and alarm assertions and de-assertions, user log ins and log outs. Each event has a Universal Time Code (UTC) time and date stamp appended to it, with a time resolution of one second. Any changes to the time and date are recorded in the system log.

The system log can be exported as a comma separated list, so that it is easy to import it in to a spreadsheet, where it can be easily filtered or sorted. For details of the logs web page, see *Chapter 5, Web GUI Control*.

In the event of problems with your unit, Ericsson Customer Support may request that you supply a copy of the unit logs to assist with the repair of your unit.

To access the logs:

1. From the web GUI, select the **Support > View Logs** web page. This page provide several links to all your log files.



View Log Files

NOTE: Various event logs are stored within the Encoder. These are retrieved via XML files, and may be viewed by clicking on the options below. Some of the files are This facility intended to be used under the direction of Ericsson support staff.

Main Event Log
To save the event log, move the mouse pointer over the links below, right-click and select "Save target as.." or "Save link target as..", dependent on the browser you are using.
You will then be prompted for a filename and a place to store the file.

Since Power On:
[Right Click to view event log since power on \('messages'\) file](#)

Complete Event Log:
[Right Click to view event log](#)
[Right Click to view event log tail](#)
[Right Click to view event log, formatted with tabs](#)
[Right Click to view the event log as tabbed CSV file*](#)
*NOTE: This is a TAB separated CSV file, and may not display correctly in some Browsers (alternative comma separated version).

Other Logs
The logs are primarily intended to be used in conjunction with Ericsson Support Staff, and may require non-default options to be enabled. To extract any of the logs, move the mouse pointer over the links below, right-click and select "Save target as.." or "Save link target as..", dependent on the browser you are using.
You will then be prompted for a filename and a place to store the file.

[HTTP Server Log](#) [SNMP log](#)
[kern.log](#) [daemon.log](#)

Other Encoders
This data is primarily intended to be used in conjunction with Ericsson Support Staff.
The links display summary data on other encoders sharing the same same LAN.

[Similar Units](#) [Similar Units as XML](#)
[All Encoders](#) [All Encoders as XML](#)

Figure 8.5 Viewing Logs

2. Right-click on the relevant link (as requested by Ericsson Customer Support) to display a context menu and select **Save Target As...** or **Save Link Target As...**, or similar depending on the browser you are using.
3. A dialog will then be displayed prompting you for a file name and a location to store the file. Save the file to your computer.
4. Attach the file to an email and send your email to Ericsson Customer Support.

8.8 Calling a Service Engineer

If you cannot resolve a problem with your equipment using the information provided in this chapter, or if you experience technical or operational difficulties, please do not hesitate to contact us to request assistance.



There is a lot of information you can give us that will enable us to diagnose your problem swiftly. When contacting us please provide the following:

- Serial number. To obtain this, click the **About** button on any web GUI page.
- Software version number. To obtain this, click the **About** button on any web GUI page or view the front panel **System > Versions** screen.
- Configuration, both hardware and software. To obtain a copy of your current configuration, go to the **Configure > Save-Load** web page and obtain an XML file.
- Unit logs, if relevant. To obtain these, go to the **Support > View Logs** web page.
- System architecture and environment.
- Description of the symptoms and what diagnosis and tests have already been attempted.
- Any external events that may be related as triggers of the symptoms. If so, at what local time?
- Wireshark IP captures, if relevant.
- System logs from any controlling application software, if relevant.

In addition to the above, please do not forget to provide us with your contact details to enable us to get in touch with you swiftly:

- Name(s).
- Telephone and fax numbers.
- Email address.
- Business address.

8.9 Disposing of This Equipment

Dispose of this equipment safely at the end of its life. Local codes and/or environmental restrictions may affect its disposal. Regulations, policies and/or environmental restrictions differ throughout the world. Contact your local jurisdiction or local authority for specific advice on disposal.

See *Annex B, Technical Specification* for further details.



BLANK



Glossary

Annex A

The following list covers most of the abbreviations, acronyms and terms as used in Ericsson Manuals, User and Reference Guides. All terms may not be included in this Reference Guide.

μm	Micrometer (former name - micron): a unit of length equal to one millionth (10 ⁻⁶) of a meter.
1000BaseT	The term for the Electrical Gigabit Ethernet interface. This is the most common interface for Gigabit Ethernet. Most Gigabit-enabled PCs and equipment use this interface.
3:2 pull-down	A technique used when converting film material (which operates at 24 pictures per second) to 525-line video (operating at 30 pictures per second).
4:2:0	Digital video coding method in which the color difference signals are sampled on alternate lines at half the luminance rate.
4:2:2	Digital video coding method in which the color difference signals are sampled on all lines at half the luminance rate.
422P@ML	422 Profile at Main Level: A subset of the MPEG-2 standard, which supports digital video storage (DVD etc.) and transmissions up to 50 Mbps over various mediums. Used for Contribution and Distribution applications.
5B6B	5 Binary Bits Encoded to 6 Binary Bits: Block code.
ABR	Adaptive Bit Rate.
ADPCM	Adaptive Differential Pulse Code Modulation: An advanced PCM technique that converts analogue sound into digital data and vice versa. Instead of coding an absolute measurement at each sample point, it codes the difference between samples and can dynamically switch the coding scale to compensate for variations in amplitude and frequency.
ACC	Authorization Control Computer.
ADT	Audio, Data And Teletext.
AFC	Automatic Frequency Control.
AFS	Automation File Server.
AGC	Automatic Gain Control.

AMOL I and II	Automatic Measure of Line-ups I and II: Used by automated equipment to measure programme-viewing ratings.
ARP	Address Resolution Protocol. A protocol used to "resolve" IP addresses into underlying Ethernet MAC addresses.
ASI	Asynchronous Serial Interface.
ASIC	Application-Specific Integrated Circuit: A customized chip designed to perform a specific function.
Async	Asynchronous.
ATM	Asynchronous Transfer Mode: A connection orientated, cell based, data transport technology designed for Broadband ISDN (B-ISDN). It provides a circuit-switched bandwidth-on-demand carrier system, with the flexibility of packet switching. It offers low end-to-end delays and (negotiable on call set up) Quality of Service guarantees. Asynchronous refers to the sporadic nature of the data being transmitted. Cells are transmitted only when data is to be sent, therefore the time interval between cells varies according to the availability of data.
ATSC	Advanced Television Standards Committee: An organization founded in 1983 to research and develop a digital TV standard for the U.S.A. In late 1996, the FCC adopted the ATSC standard, the digital counterpart of the NTSC standard.
B3ZS	Bipolar with Three Zero Substitution: A method of eliminating long zero strings in a transmission. It is used to ensure a sufficient number of transitions to maintain system synchronization when the user data stream contains an insufficient number of 1s to do so. B3ZS is the North American equivalent of the European HDB3.
Backward Compatibility	Refers to hardware or software that is compatible with earlier versions.
BAT	Bouquet Association Table: Part of the service information data. The BAT provides information about bouquets. It gives the name of the bouquet and a list of associated services.
baud rate	The rate of transfer of digital data when the data comprises information symbols that may consist of a number of possible states. Equivalent to bit rate when the symbols only have two states (1 and 0). Measured in Baud.
BER	Bit Error Rate: A measure of transmission quality. The rate at which errors occur in the transmission of data bits over a link. It is generally shown as a negative exponent, (e.g., 10^{-7} means that 1 in 10,000,000 bits are in error).
BISS	Basic Interoperable Scrambling System: Non-proprietary encryption from EBU (Tech3290).
Bit rate	The rate of transfer of digital data when the data comprises two logic states, 1 and 0. Measured in bit/s.
Block; Pixel Block	An 8-row by 8-column matrix of luminance sample values, or 64 DCT coefficients (source, quantized, or de-quantized).

Bouquet	A collection of services (TV, radio, and data, or any combination of the three) grouped and sold together, and identified in the SI as a group. A single service may be in several bouquets.
B-Picture; B-Frame	Bi-directionally Predictive Coded Picture/Frame: A picture that is coded using motion-compensated prediction from previous I or P frames (forward prediction) and/or future I or P frames (backward prediction). B frames are not used in any prediction.
BPSK	Binary Phase Shift Keying: A data modulation technique.
Buffer	A memory store used to provide a consistent rate of data flow.
BW	Bandwidth: The transmission capacity of an electronic line such as (among others) a communications network, computer bus, or broadcast link. It is expressed in bits per second, bytes per second or in Hertz (cycles per second). When expressed in Hertz, the frequency may be a greater number than the actual bits per second, because the bandwidth is the difference between the lowest and highest frequencies transmitted. High bandwidth allows fast transmission or high-volume transmission.
Byte-mode	Each byte is delivered separately in the ASI transport stream, with stuffing data added between the Bytes to increase the data rate to 270 Mbps. See DVB Document A010 rev. 1, Section B3.3, (ASI) Layer-2 Transport Protocol.
CA	Conditional Access: The technology used to control the access to viewing services to authorized subscribers through the transmission of encrypted signals and the programmable regulation of their decryption by a system such as viewing cards.
CAT	Conditional Access Table: Part of the MPEG-2 Program Specific Information (PSI) data. Mandatory for MPEG-2 compliance if CA is in use.
C-Band	The portion of the electromagnetic spectrum, which spans the frequency range of approximately 4 GHz to 6 GHz. Used by communications satellites. Preferred in tropical climates because it is not susceptible to fading.
CCIR	See: ITU-R.
CCITT	See: ITU-T.
Channel	a narrow range of frequencies, part of a frequency band, for the transmission of radio and television signals without interference from other channels. In the case of OFDM, a large number of carriers spaced apart at precise frequencies are allocated to a channel.
Channel Coding	A way of encoding data in a communications channel that adds patterns of redundancy into the transmission path in order to improve the error rate. Such methods are widely used in wireless communications.

Chrominance	The color part of a TV picture signal, relating to the hue and saturation but not to the luminance (brightness) of the signal. In a composite-coded color system, the color information (chrominance, often referred to as chroma) is modulated onto a high frequency carrier and added to the monochrome-format video signal carrying the luminance (Y). In a component-coded color system, the two color-difference signals (R-Y)(B-Y) usually referred to as $C_R C_B$ (digital) or $P_R P_B$ (analogue), are used to convey color information. When $C_R C_B$ ($P_R P_B$) is added to the luminance (Y), the complete picture information is conveyed as $YC_R C_B$ ($YP_R P_B$).
Closed Captioning	A TV picture subtitling system used with 525-line analogue transmissions.
CODE	Create Once Distribute Everywhere.
Codec	The combination of an Encoder and a complementary Decoder located respectively at the input and output of a transmission path.
COFDM	Coded OFDM: COFDM adds forward error correction to the OFDM transmission consisting of Reed-Solomon (RS) coding followed by convolutional coding to add extra bits to the transmitted signal. This allows a large number of errors at the receive end to be corrected by convolutional (Viterbi) decoding followed by RS decoding.
Composite	CVBS Video Signal, 1 V _{pk-pk}
Compression	Reduction in the number of bits used to represent the same information. For the purposes of a broadcast system, it is the process of reducing digital picture information by discarding redundant portions of information that are not required when reconstituting the picture to produce viewing clarity. Compression allows a higher bite-rate to be transmitted through a given bandwidth.
Compression System	Responsible for compressing and multiplexing the video / audio / data bitstreams, together with the authorization stream. The multiplexed data stream is then ready for transmission.
$C_R C_B$	Digital Color difference signals. These signals, in combination with the luminance signal (Y), define the color and brightness of each picture element (pixel) on a TV line. See: Chrominance
CRC	Cyclic Redundancy Check: A mathematical algorithm that computes a numerical value based on the bits in a block of data. This number is transmitted with the data and the receiver uses this information and the same algorithm to ensure the accurate delivery of data by comparing the results of algorithm and the number received. If a mismatch occurs, an error in transmission is presumed.
CVBS	Color Video Black Sync Signal
dB	Decibels: A ratio of one quantity to another using logarithmic scales to give results related to human aural or visual perception. dB is a ratio whereas dBm, for example, is an absolute value, quoted as a ratio to a fixed point of 0 dBm. 0 dBm is 1 mW at 1 kHz terminated in 600Ω. 0 dBmV is 1 mV terminated in 75Ω.

DCE	Data Communications Equipment: Typically a modem. It establishes, maintains and terminates a session on a network but in itself is not the source (originator) or destination (end receiving unit) of signals (e.g. a computer, see DTE). A DCE device may also convert signals to comply with the transmission path (network) format.
DCT	Discrete Cosine Transform: A technique for expressing a waveform as a weighted sum of cosines. Raw video data is not readily compressible. DCT is not in itself a compression technique but is used to process the video data so that it is compressible by an encoder. DCT processes the picture on an 8x8-pixel block basis, converting the data from an uncompressible X Y form (as displayed by an oscilloscope) to a compressible frequency domain form (as displayed by a spectrum analyzer). Can be forward DCT or inverse DCT.
DDS	Direct Digital Synthesiser.
Decoder	The unit containing the electronic circuitry necessary to decode encrypted signals. Some Decoders are separate from the receiver but in satellite TV broadcasting, the term is often used interchangeably as a name for an Integrated Receiver Decoder (IRD). The term IRD, or IRD / Decoder, is usually associated with satellite TV broadcasting while Cable systems are based on Converters or on Set-Top Boxes / Converters.
Decoding Time stamp	A field that may be present in a PES packet header that indicates the time that an access unit is to be decoded in the system target Decoder.
DENG	Digital Electronic News Gathering
DID	Data Identifier.
Differential Coding	Method of coding using the difference between the value of a sample and a predicted value.
DiffServ	Differentiated Services. A mechanism used on layer 3 - e.g. the IP layer - to differentiate between traffic of various types. DiffServ is based on the ToS field and provides a mechanism for the network to give e.g. video traffic higher priority than other traffic (for example Internet traffic).
DIL	Dual In Line: The most common type of package for small and medium scale integrated circuits. The pins hang vertically from the two long sides of the rectangular package, spaced at intervals of 0.1 inch.
DIN	Deutsches Institut für Normung: German Standards Institute.
Downlink	The part of the satellite communications circuit that extends from the satellite to an Earth station.
Downconvert	The process by which the frequency of a broadcast transport stream is shifted to a lower frequency range.
DPCM	Differential Pulse Code Modulation: An audio digitization technique that codes the difference between samples rather than coding an absolute measurement at each sample point.

DSNG	Digital Satellite News-Gathering.
DSP	Digital Signal Processor.
DTE	Data circuit Terminating Equipment: A communications device that originates (is the source) or is the end receiving unit (destination) of signals on a network. It is typically a terminal or computer.
DTH	Direct-To-Home. The term used to describe uninterrupted transmission from the satellite directly to the subscriber, that is, no intermediary cable or terrestrial network utilized.
DTMF	Dual-Tone MultiFrequency
DVB	Digital Video Broadcasting: A European project which has defined transmission standards for digital broadcasting systems using satellite (DVB-S), cable (DVB-C) and terrestrial (DVB-T) medium, created by the EP-DVB group and approved by the ITU. Specifies modulation, error correction, etc. (see EN 300 421 for satellite, EN 300 429 for cable and EN 300 744 for terrestrial).
DVB SI	Digital Video Broadcasting Service Information.
DVB-PI	DVB-Professional Interfaces: TTV Lan search shows – DVB Physical Interfaces
DWDM	Dense Wavelength Division Multiplexing. A mechanism to utilize existing fiber with even more bandwidth by adding extra signals using other wavelengths/colors
Earth	<p>Technical Earth: Ensures that all equipment chassis within a rack are at the same potential, usually by connecting a wire between the Technical earth terminal and a suitable point on the rack. This is sometimes known as a Functional earth.</p> <p>Protective Earth: Used for electric shock protection. This is sometimes known as a safety earth.</p>
EBU	European Broadcast Union.
ECM	Entitlement Control Message.
EDI	Ethernet Data Input
EIA	Electronics Industries Association (USA).
EIT	<p>Event Information Table: Equipment: A component of the DVB-Service Information (SI) stream generated within an Encoder, containing information about events or programmes such as event name, start time, duration, etc.</p> <p>System: EIT (Present/Following) contains the name of the current and next event. It may include an optional descriptor (synopsis) giving brief details of content. EIT (Schedule) is used to produce a full EPG. The EIT is the only DVB-SI table, which can be encrypted.</p>
Elementary Stream	A generic term for a coded bitstream, be it video, audio or other.
EMC	Electromagnetic Compatibility.
EMM	Entitlement Management Message.

Encryption	Encoding of a transmission to prevent access without the appropriate decryption equipment and authorization.
EPG	Electronic Programme Guide: On-screen programme listing using thumbnail pictures and/or text.
Ethernet	The most widely used local area network (LAN) defined by the IEEE as the 802.3 standard. Transmission speeds vary according to the configuration. Ethernet uses copper or fiber-optic cables.
ETS	European Telecommunications Standard.
ETSI	European Telecommunications Standards Institute.
FBAS	German for CVBS
FCC	Federal Communications Commission.
FDM	Frequency Division Multiplex: A common communication channel for a number of signals, each with its own allotted frequency.
FEC	Forward Error Correction: A method of catching errors in a transmission. The data is processed through an algorithm that adds extra bits and sends these with the transmitted data. The extra bits are then used at the receiving end to check the accuracy of the transmission and correct any errors.
FFT	Fast Fourier Transformation: A fast algorithm for performing a discrete Fourier transform.
FIFO	First In, First Out: A data structure or hardware buffer from which items are taken out in the same order they were put in. Also known as a shelf from the analogy with pushing items onto one end of a shelf so that they fall off the other. A FIFO is useful for buffering a stream of data between a sender and receiver that are not synchronized - i.e. they not sending and receiving at exactly the same rate.
FM	Frequency Modulation: Analogue modulation procedure
Footprint	The area of the Earth's surface covered by a satellite's downlink transmission. Also (generally) the area from which the satellite can receive uplink transmissions.
FTP	File Transfer Protocol: A protocol used to transfer files over a TCP/IP network (Internet, UNIX, etc.). For example, after developing the HTML pages for a Web site on a local machine, they are typically uploaded to the Web server, using FTP. Unlike e-mail programs in which graphics and program files have to be attached, FTP is designed to handle binary files directly and does not add the overhead of encoding and decoding the data.
G.703	The ITU-T standard which defines the physical and electrical characteristics of hierarchical digital interfaces.
GOP	Group of Pictures: MPEG video compression works more effectively by processing a number of video frames as a block. The Ericsson AB Encoder normally uses a 12 frame GOP; every twelfth frame is an I frame.

GUI	Graphical User Interface: The use of pictures rather than just words to represent the input and output of a program. A program with a GUI runs under a windowing system and has a screen interface capable of displaying graphics in the form of icons, drop-down menus and a movable pointer. The on-screen information is usually controlled / manipulated by a mouse or keyboard.
HDTV	High Definition Television.
HPA	High Power Amplifier: Used in the signal path to amplify the modulated and up-converted broadcast signal for feeding to the uplink antenna.
HSYNC	Horizontal (line) SYNCs.
HTTP	HyperText Transfer Protocol. The fundamental protocol used on the Internet for transmission of WEB pages and other data between servers and PCs
HU	Height Unit
Hub	A device in a multi-point network at which branch nodes interconnect.
ICAM	Integrated Conditional Access Module: Embedded in the IRD and responsible for descrambling, plus packet filtering and reception. It also contains the physical interface to the subscriber's viewing card.
ICMP	Internet Control Message Protocol. ICMP messages, delivered in IP packets, are used for out-of-band messages related to network operation or mis-operation
IGMP	Internet Group Management Protocol. IGMP is a protocol used to manage multicasts on the Internet. For a host (receiver unit) to receive a multicast, it needs to transmit IGMP "join" messages on the right format. Three versions exist. IGMPv2 is common today but IGMPv3 is the next step.
IDU	Indoor unit
IEC	International Electrotechnical Committee.
IF	Intermediate Frequency: Usually refers to the 70 MHz or 140 MHz output of the Modulator in cable, satellite and terrestrial transmission applications.
Interframe Coding	Compression coding involving consecutive frames. When consecutive frames are compared, temporal redundancy is used to remove common elements (information) and arrive at difference information. MPEG-2 uses B and P frames, but since they are individually incomplete and relate to other adjacent frames, they cannot be edited independently.
Intraframe Coding	Compression coding involving a single frame. Redundant information is removed on a per frame basis. All other frames are ignored. Coding of a macroblock or picture that uses information only from that macroblock or picture. Exploits spatial redundancy by using DCT to produce I frames; these are independent frames and can be edited.

IP	Internet Protocol: The IP part of TCP/IP. IP implements the network layer (layer 3) of the protocol, which contains a network address and is used to route a message to a different network or sub-network. IP accepts packets from the layer 4 transport protocol (TCP or UDP), adds its own header to it and delivers a datagram to the layer 2 data link protocol. It may also break the packet into fragments to support the Maximum Transmission / Transfer Unit (MTU) of the network.
I-picture; I-frame	Intracoded Picture/Frame: A picture / frame, which is coded using purely intracoding with reference to no other field or frame information. The I frame is used as a reference for other compression methods.
IPPV	Impulse Pay Per View: One-time events, purchased at home (on impulse) using a prearranged SMS credit line.
IRD	Integrated Receiver Decoder: The Receiver with an internal MPEG Decoder, which is connected to the subscriber's TV. The IRD is responsible for receiving and de-multiplexing all signals. The unit receives the incoming signal and if CA is active, decodes the signal when provided with a control word by the viewing card. Domestic IRDs are also known as Set-Top Units or Set-Top Boxes.
IRE	Institute of Radio Engineers: No longer in existence but the name lives on as a unit of video amplitude measurement. This unit is 1% of the range between blanking a peak white for a standard amplitude signal.
ISDN	Integrated Services Digital Network: The basic ISDN service is BRI (Basic Rate Interface), which is made up of two 64 kbps B channels and one 16 kbps D channel (2B+D). If both channels are combined into one, called bonding, the total data rate becomes 128 kbps and is four and a half times the bandwidth of a V.34 modem (28.8 kbps). The ISDN high speed service is PRI (Primary Rate Interface). It provides 23 B channels and one 64 kbps D channel (23B+D), which is equivalent to the 24 channels of a T1 line. When several channels are bonded together, high data rates can be achieved. For example, it is common to bond six channels for quality videoconferencing at 384 kbps. In Europe, PRI includes 30 B channels and one D channel, equivalent to an E1 line.
ISO	International Standards Organisation.
ISOG	Inter-union Satellite Operations Group.
ITS	Insertion Test Signal: A suite of analogue test signals placed on lines in the VBI. Also known as VITS.
ITT	Invitation To Tender.
ITU-R	International Telecommunications Union - Radiocommunications Study Groups (was CCIR).
ITU-T	International Telecommunications Union - Telecommunications Standardization Sector (was CCITT).

JPEG	Joint Photographic Experts Group: ISO/ITU standard for compressing still images. It has a high compression capability. Using discrete cosine transform, it provides user specified compression ratios up to around 100:1 (there is a trade-off between image quality and file size).
kbps	1000 bits per second.
Kbit	1024 bits, usually refers to memory capacity or allocation.
Ku-band	The portion of the electromagnetic spectrum, which spans the frequency range of approximately 12 GHz to 14 GHz. Used by communications satellites. Preferred for DTH applications because this range of frequency is less susceptible to interference.
LAN	Local Area Network: A network, which provides facilities for communications within a defined building or group of buildings in close proximity.
L-band	The frequency band from 950 MHz to 2150 MHz, which is the normal input-frequency-range of a domestic IRD. The incoming signal from the satellite is down-converted to L-band by the LNB.
LED	Light Emitting Diode.
LNB	Low Noise Block Down-Converter: The component of a subscriber satellite transmission receiving dish which amplifies the incoming signal and down-converts it to a suitable frequency to input to the IRD (typically 950 MHz - 1600 MHz).
LO	Local Oscillator.
lsb	Least significant bit.
Luminance	The television signal representing brightness, or the amount of light at any point in a picture. The Y in $Y C_R C_B$.
LVDS	Low Voltage Differential Signal: LVDS is a generic multi-purpose Interface standard for high speed / low power data transmission. It was standardized in ANSI/TIA/EIA-644-1995 Standard (aka RS-644).
Macroblock	A 16x16-pixel area of the TV picture. Most processing within the MPEG domain takes place with macro blocks. These are converted to four 8x8 blocks using either frame DCT or field DCT. Four 8 x 8 blocks of luminance data and two (4:2:0 chrominance format), four (4:2:2) or eight (4:4:4) corresponding 8 x 8 blocks of chrominance data coming from a 16 x 16 section of the luminance component of the picture. Macroblock can be used to refer to the sample data and to the coded representation of the sample values and other data elements.
Mbps	Million bits per second.
MCC	Multiplex Control Computer: A component of a System 3000 compression system. The MCC sets up the configuration for the System 3000 Multiplexers under its control. The MCC controls both the main and backup Multiplexer for each transport stream.
MCPC	Multiple Channels Per Carrier.

MEM	Multiplex Element Manager: A GUI-based control system, part of the range of Ericsson AB compression system control element products. The evolution 5000 MEM holds a model of the system hardware. Using this model, it controls the individual system elements to configure the output multiplexes from the incoming elementary streams. The MEM monitors the equipment status and controls any redundancy switching.
Meta-data	Meta-data is descriptive data that is "tagged" to a movie or audio clip. Meta-data is essential for the broadcaster.
MMDS	Multichannel Microwave Distribution System: A terrestrial microwave direct-to-home broadcast transmission system.
Motion Compensation	The use of motion vectors to improve the efficiency of the prediction of sample values. The prediction uses motion vectors to provide offsets into the past and/or future reference frames or fields containing previously decoded sample values that are used to form the prediction error signal.
Motion Estimation	The process of estimating motion vectors in the encoding process.
Motion Vector	A two-dimensional vector used for motion compensation that provides an offset from the coordinate position in the current picture or field to the coordinates in a reference frame or field.
MP@ML	Main Profile at Main Level: A subset of the MPEG-2 standard, which supports digital video storage (DVD etc.) and transmissions up to 15 Mbps over various mediums.
MP@HL	Main Profile at High Level: A subset of the MPEG-2 standard, which supports digital video storage (DVD etc.) and transmissions up to 80 Mbps over various mediums.
MPEG	Moving Pictures Experts Group: The name of the ISO/IEC working group which sets up the international standards for digital television source coding.
MPEG-2	Industry standard for video and audio source coding using compression and multiplexing techniques to minimize video signal bit rate in preparation for broadcasting. Specified in ISO/IEC 13818. The standard is split into layers and profiles defining bit rates and picture resolutions.
MPLS	Multi-protocol Label Switching. A Quality of Service mechanism for IP networks that allow IP packets to flow along a predefined path in a network, improving the reliability and robustness of the transmission.
MPM	Media Processing Module.
MPTS	Multi-Program Transport Streams. Transport Streams that carry multiple TV/Radio services.
msb	Most significant bit.
Msymbol/s	(Msym/s) Mega (million) Symbols per second (10^6 Symbols per second).

Multiplex	A number of discrete data streams (typically 8 to 12), from encoders, that are compressed together in a single DVB compliant transport stream for delivery to a Modulator.
Multicast	An IP mechanism that allows transmission of data to multiple receivers. A multicast can also have several transmit sources simultaneously. In video applications, multicast is typically used to distribute a video signal from a central source to multiple destinations.
MUSICAM	Masking pattern adapted Universal Sub-band Integrated Coding And Multiplexing: An audio bit rate reduction system relying on sub-band coding and psychoacoustic masking.
Mux	<p>Multiplexer: Transmission Multiplexer: receives EMMs from the ACC, ECMs from the BCC, video/audio data from the encoders, and the SI stream from the SIC. It then multiplexes them all into a single DVB-compliant transport stream, and delivers the signal to the uplink after modulation.</p> <p>The Multiplexer also contains the cipher card, which scrambles the services according to the control words supplied by the BCC.</p>
Network	In the context of broadcasting: a collection of MPEG-2 transport stream multiplexes transmitted on a single delivery system, for example, all digital channels on a specific cable system.
NICAM	Near Instantaneously Companded Audio Multiplex: Official name is NICAM 728. Used for digital stereo sound broadcasting in the UK employing compression techniques to deliver very near CD quality audio. 728 refers to the bit rate in kbps.
NIT	Network Information Table: Part of the service information data. The NIT provides information about the physical organization of each transport stream multiplex, and the characteristics of the network itself (such as the actual frequencies and modulation being used).
nm	Nanometer: a unit of length equal to one thousand millionth (10^{-9}) of a meter.
NMS	Network Management System. A system used to supervise elements in an IP network. When a device reports an alarm, the alarm will be collected by the NMS and reported to the operator. NMS systems typically collect valuable statistics information about the network performance and can warn the operator early.
NTSC	National Television Systems Committee: The group, which developed analogue standards used in television broadcast systems in the United States. Also adopted in other countries (e.g. Mexico, Canada, Japan). This system uses 525 picture lines and a 59.97 Hz field frequency.
NVOD	Near Video On-Demand: Method of offering multiple showings of movies or events. The showings are timed to start at set intervals, determined by the broadcaster. Each showing of a movie or event can be sold to subscribers separately.

NVRAM	Non-volatile Random Access Memory: Memory devices (permitting random read / write access) that do not lose their information when power is removed. Stores the default configuration parameters set by the user.
ODU	Outdoor Unit
OFDM	Orthogonal Frequency Division Multiplex: A modulation technique used for digital TV transmission in Europe, Japan and Australia; more spectrally efficient than FDM. In OFDM, data is distributed over a large number of carriers spaced apart at precise frequencies. The carriers are arranged with overlapping sidebands in such a way that the signals can be received without adjacent channel interference.
OPPV	Order ahead Pay Per View: An advance purchase of encrypted one-time events with an expiry date.
OSD	On-screen display: Messages and graphics, typically originating from the SMS, and displayed on the subscriber's TV screen by the IRD, to inform the subscriber of problems or instruct the subscriber to contact the SMS.
Packet	A unit of data transmitted over a packet switching network. A packet consists of a header followed by a number of contiguous bytes from an elementary data stream.
PAL	Phase Alternating Line: A color TV broadcasting system where the phase of the R-Y color-difference signal is inverted on every alternate line to average out errors providing consistent color reproduction.
PAT	Program Association Table: Part of the MPEG-2 Program Specific Information (PSI) data and is mandatory for MPEG-2 compliance. The PAT points (maps) to the PMT.
PCM	Pulse Code Modulation: A process in which a signal is sampled, each sample is quantized independently of other samples, and the resulting succession of quantized values is encoded into a digital signal.
PCR	Program Clock Reference: A time stamp in the transport stream from which the Decoder timing is derived.
PDC	Program Delivery Control: A Teletext service allowing simple programming (i.e. VideoPlus) of VCR recording times. If the desired program is rescheduled, PDC updates the programming information in the VCR.
Pel	Picture Element: Also known as a pixel. The smallest resolvable rectangular area of an image either on a screen or stored in memory. On-screen, pixels are made up of one or more dots of color. Monochrome and grey-scale systems use one dot per pixel. For grey-scale, the pixel is energized with different intensities, creating a range from dark to light (a scale of 0-255 for an eight-bit pixel). Color systems use a red, green and blue dot per pixel, each of which is energized to different intensities, creating a range of colors perceived as the mixture of these dots. If all three dots are dark, the result is black. If all three dots are bright, the result is white.

PES	Packetized Elementary Stream: A sequential stream of data bytes that has been converted from original elementary streams of audio and video access units and transported as packets. Each PES packet consists of a header and a payload of variable length and subject to a maximum of 64 kbytes. A time stamp is provided by the MPEG-2 systems layer to ensure correct synchronization between related elementary streams at the Decoder.
PID	Packet Identifier: the header on a packet in an elementary data stream, which identifies that data stream. An MPEG-2 / DVB standard.
PIN	Personal Identification Number: A password used to control access to programming and to set purchase limits. Each subscriber household can activate several PINs and may use them to set individual parental rating or spending limits for each family member.
Pixel	PIX (picture) Element: The digital representation of the smallest area of a television picture capable of being delineated by the bit-stream. See Pel for more information.
pk-pk	peak to peak: Measurement of a signal or waveform from its most negative point to its most positive point.
PLL	Phase-Locked Loop. A phase-locked loop is a control system which controls the rotation of an object by comparing its rotational position (phase) with another rotating object as in the case of a sine wave or other repeating signal. This type of control system can synchronize not only the speed, but also the angular position of two waveforms that are not derived from the same source.
PMT	Program Map Table: Part of the MPEG-2 Program Specific Information (PSI) data and is mandatory for MPEG-2 compliance. Each service has a PMT, which lists the component parts (elementary streams of video, audio, etc.) for the various services being transmitted.
P-picture/P-frame	A picture / frame produced using forward prediction. It contains predictions from either previous I frames or previous P frames. The P frame is used as a reference for future P or B frames.
ppm	Parts per million.
PPV	Pay Per View: A system of payment for viewing services based on a usage / event basis rather than on on-going subscription. Subscribers must purchase viewing rights for each PPV event that they wish to view. PPV events may be purchased as IPPV or OPPV.
Program	PC - A sequence of instructions for a computer. TV - A concept having a precise definition within ISO 13818-1 (MPEG-2). For a transport stream, the timebase is defined by the PCR. The use of the PCR for timing information creates a virtual channel within the stream.
Programme	A linking of one or more events under the control of a broadcaster. For example, football match, news, film show. In the MPEG-2 concept, the collection of elementary streams comprising the programme, have a common start and end time. A series of programmes are referred to as events.

P_RP_B	Analogue Color difference signals. Refer to C _R C _B for an explanation.
PROM	Programmable Read-Only Memory: A device, which may be written once with data for permanent storage, and then read whenever required. Special types of PROM permit the erasure of all data by Ultraviolet light (EPROM) or by application of an electronic signal (EEPROM).
PS	Program Stream: A combination of one or more PESs with a common timebase.
PSI	Program Specific Information: Consists of normative data, which is necessary for the de-multiplexing of transport streams and the successful regeneration of programs (see also: SI).
PSIP	Program System Information Protocol: The ATSC equivalent of SI for DVB.
PSK	Phase Shift Keying: A method of modulating digital signals particularly suited to satellite transmission.
PSR	Professional Satellite Receiver: See also: IRD.
PSU	Power Supply Unit.
QAM	Quadrature Amplitude Modulation: A method of modulating digital signals, which uses combined techniques of phase modulation and amplitude modulation. It is particularly suited to cable networks.
QoS	Quality of Service. A common term for a set of parameters describing the quality you get from an IP network: Throughput, availability, delay, jitter and packet loss.
QPSK	Quadrature Phase Shift Keying: A form of phase shift keying modulation using four states.
QSIF	Quarter Screen Image Format.
Quantise	A process of converting analogue waveforms to digital information. 8-bit quantization as set out in ITU-R Rec. 601. Uses 256 levels in the range 0 – 255 to determine the analogue waveform value at any given point. The value is then converted to a digital number for processing in the digital domain.
RAM	Random Access Memory: A volatile storage device for digital data. Data may be written to, or read from, the device as often as required. When power is removed, the data it contains is lost.
RAS	Remote Authorization System: An Ericsson AB proprietary public-key encryption system used to prevent unauthorized viewing of a TV programme or programmes.
Reflex™	An Ericsson AB proprietary system to provide efficient use of bandwidth by a set of encoders without sacrificing picture quality. A group bit rate is allocated to a set of Encoders and the bit rate for each Encoder is allocated according to the requirements of the picture encoding process.
RF	Radio Frequency.
RGB	Red, Green, Blue: The Chroma information in a video signal.

RIP2	Routing Information Protocol v2. A protocol used between network routers to exchange routing tables and information.
ROM	Read Only Memory: A non-volatile storage device for digital data. Data has been stored permanently in this device. No further information may be stored (written) there and the data it holds cannot be erased. Data may be read as often as required.
RS	Reed-Solomon coding: An error detection and correction, coding system. 16 bytes of Reed-Solomon Forward Error Correction code are appended to the packet before transmission bringing the packet length to 204 bytes. The 16 bytes are used at the receiving end to correct any errors. Up to eight corrupted bytes can be corrected.
RSVP	ReSerVation Protocol. A Quality-of-service oriented protocol used by network elements to reserve capacity in an IP network before a transmission takes place.
RTP	Real-time Transfer Protocol. A protocol designed for transmission of real-time data like video and audio over IP networks. RTP is used for most video over IP transmissions.
RLC	Run Length Coding: Minimization of the length of a bit-stream by replacing repeated characters with an instruction of the form 'repeat character x y times'.
SBR	Spectral Band Replication.
SCPC	Single Channel Per Carrier.
Spectral Scrambling	A process (in digital transmission) used to combine a digital signal with a pseudo-random sequence, producing a randomized digital signal that conveys the original information in a form optimized for a broadcast channel.
Scrambling	Alteration of the characteristics of a television signal in order to prevent unauthorized reception of the information in clear form.
SDI	Serial Digital Interface.
SDT	Service Description Table: Provides information in the SI stream about the services in the system; for example, the name of the service, the service provider, etc.
SDTI	Serial Data Transport Interface. A mechanism that allows transmission of various types of data over an SDI signal. This may be one or more compressed video signals or other proprietary data types. The advantage of SDTI is that existing SDI transmission infrastructure can be used to transport other types of data.
SELV	Safety Extra Low Voltage (EN 60950).
SFP	Small Form-factor Pluggable module. A standardized mechanism to allow usage of various optical interfaces for Gigabit Ethernet. Several types of SFP modules exist: Single-mode fiber modules for long-distance transmission and multi-mode fiber modules for shorter distances. SFP is also known as "mini-GBIC".

SIP	Session Initiation Protocol. A common acronym for the ongoing effort to standardize signaling over IP networks, i.e. connection set-up and tear-down. SIP makes it possible to "dial" a remote receiver of data and set-up the connection in this way.
STB	Set-Top Box: A box that sits on top of a television set and is the interface between the home television and the cable TV company. New technologies evolving for set-top boxes are video-on-demand, video games, educational services, database searches, and home shopping. The cable equivalent of the IRD.
SFN	Single Frequency Network: The SFN technique allows large geographic areas to be served with a common transmission multiplex. All transmitters in the network are synchronously modulated with the same signal and they all radiate on the same frequency. Due to the multi-path capability of the multi-carrier transmission system (COFDM), signals from several transmitters arriving at a receiving antenna may contribute constructively to the total wanted signal. The SFN technique is not only frequency efficient but also power efficient because fades in the field strength of one transmitter may be filled by another transmitter.
SI	Service Information: Digital information describing the delivery system, content and scheduling (timing) of broadcast data streams. DVB-SI data provides information to enable the IRD to automatically demultiplex and decode the various streams of programmes within the multiplex. Specified in ISO/IEC 13818[1]. (DVB)
Single Packet Burst Mode	A burst of ASI bytes (either 188 or 204, depending on packet length) is contiguously grouped into an MPEG-2 transport stream packet. Stuffing data is added between the packets to increase the data rate to 270 Mbps. See DVB Document A010 rev. 1, Section B3.3, (ASI) Layer-2 Transport Protocol.
Smart Card	A plastic card with a built-in microprocessor and memory used for identification, financial transactions or other authorizing data transfer. When inserted into a reader, data is transferred to and from the host machine or a central computer. It is more secure than a magnetic stripe card and it can be disabled if the wrong password is entered too many times. As a financial transaction card, it can be loaded with digital money and used in the same way as cash until the balance reaches zero. The file protocol is specific to its intended application.
SMATV	Satellite Mast Antenna Television: A distribution system, which provides sound and television signals to the households of a building or group of buildings, typically used to refer to an apartment block.
SMPTE	Society of Motion Picture and Television Engineers.

SMS	Subscriber Management System: A system which handles the maintenance, billing, control and general supervision of subscribers to conditional access technology viewing services provided through cable and satellite broadcasting. An SMS can be an automatic (e.g. Syntellect) system where subscribers order entitlements by entering information via a telephone. Alternatively, an SMS can be a manual system, which requires subscribers to speak with an operator who then manually enters their entitlement requests. Some systems support multiple SMSs.
SNG	Satellite News-Gathering.
SNMP	Simple Network Management Protocol.
SNTP	Simple Network Time Protocol is an Internet protocol used to synchronize the clocks of computers to some time reference. It is a simplified version of the protocol NTP protocol which is too complicated for many systems.
Spatial Redundancy	Information repetition due to areas of similar luminance and/or chrominance characteristics within a single frame. Removed using DCT and Quantization (Intra-Frame Coding).
SPI	Synchronous Parallel Interface.
Statistical Redundancy	Data tables are used to assign fewer bits to the most commonly occurring events, thereby reducing the overall bit rate. Removed using Run Length Coding and Variable Length Coding.
TAXI	Transparent Asynchronous Tx / Rx Interface: A proprietary high speed data interface.
TCP / IP	Transmission Control Protocol/Internet Protocol: A set of communications protocols that may be used to connect different types of computers over networks.
TDM	Time Division Multiplex: One common, communications channel carrying a number of signals, each with its own allotted time slot.
TDT	Time and Date Table: Part of the DVB Service Information. The TDT gives information relating to the present time and date.
Temporal Redundancy	Information repetition due to areas of little or no movement between successive frames. Removed using motion estimation and compensation (Inter-Frame Coding).
Time stamp	A term that indicates the time of a specific action such as the arrival of a byte or the presentation of a presentation unit.
TNS	Temporal Noise Shaping.
TOT	Time Offset Table: This optional SI table supports the use of local offsets as well as the UTC time/date combination. The purpose of the table is to list by country the current offset from UTC and the next expected change to that offset (to track when daylight saving occurs). The offset resolution is to within 1 minute over a range of ± 12 hours from UTC.

Transport Stream	A set of packetized elementary data streams and SI streams, which may comprise more than one programme, but with common synchronization and error protection. The data structure is defined in ISO/IEC 13818-1 [1] and is the basis of the ETSI Digital Video Broadcasting standards.
Transport Stream Packet Header	A data structure used to convey information about the transport stream payload.
TS	Transport Stream.
TSDT	Transport Stream Descriptor Table: A component of the MPEG-2 PSI data. This table describes which type of Transport stream it is in (i.e. DVB, ATSC etc.). It may also contain other descriptors.
TSP	Transport Stream Processor.
U	44.45 mm (rack height standard).
UART	Universal Asynchronous Receiver Transmitter: A device providing a serial interface for transmitting and receiving data.
UDP	User Datagram Protocol. A protocol above the IP layer that provides port multiplexing in addition. In essence, you can transmit IP data packets to several receiving processes in the same unit/device.
Unicast	Point-to-point connection, i.e. the "opposite" of multicast which is one to many (or many to many). In this mode, a transmit unit sends video data direct to a unique destination address.
Upconvert	The process by which the frequency of a broadcast transport stream is shifted to a higher frequency range.
Uplink	The part of the communications satellite circuit that extends from the Earth to the satellite.
UPS	Uninterruptable Power Supply: A method of supplying backup power when the electrical power fails or drops to an unacceptable voltage level. Small UPS systems provide battery power for a few minutes; enough to power down the computer in an orderly manner. This is particularly important where write back cache is used. Write back cache is where modified data intended for the disk is temporarily stored in RAM and can be lost in the event of a power failure. Sophisticated systems are tied to electrical generators that can provide power for days. UPS systems typically provide surge suppression and may provide voltage regulation.
UTC	Universal Time Code: An internationally agreed basis for timekeeping introduced in 1972 and based on international atomic time (corresponds to Greenwich Mean Time or GMT).
VCM	Video Compression Module.
VITC	Vertical Interval Time Code.
VITS	Vertical Interval Test Signal: See: ITS.
VLAN	Virtual LAN, a network of units that behave as if they are connected to the same wire even though they may actually be physically located on different segments of a LAN.



VPS	Video Programming System: A German precursor to PDC
WSS	Wide Screen Switching: Data used in wide-screen analogue services, which enables a receiver to select the appropriate picture display mode.
WST	World System Teletext: System B Teletext. Used in 625 line / 50 Hz television systems (ITU-R 653).
XILINX	A type of programmable Integrated Circuit.
XLR	Audio connector featuring three leads, two for signal and one for GND.
XML	eXtensible Markup Language. A very common self-describing text-based data format. Used for many purposes: Meta-data, configuration files, documents, etc. The readability of the format has made it very popular and is now the fundament for many types of WEB services.
XPO	The name given to the second generation Ericsson standard for web pages and additional supporting interfaces.
Y (Luminance)	Defines the brightness of a particular point on a TV line. The only signal required for black and white pictures.
Y/C	Broadcast video with separate color, Y (luminance) and C (Chroma) (sometimes called S-Video).
YUV	Y: Luminance component (Brightness), U and V: Chrominance (Color difference)



Technical Specification

Annex B

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B.1 IP Output Transport Stream

The following parameters are controllable for each IP Output transport stream for each output port or ports depending on the redundancy mode that is selected.

Table B.1 IP Output Transport Stream

Parameter	Description / Range	Comment
Source IP Address	aaa.bbb.ccc.ddd	Source IP address
Subnet Mask	aaa.bbb.ccc.ddd	Source Subnet address
Source UDP Port	0 to 65535	Source IP Port Number
Destination IP Address	aaa.bbb.ccc.ddd	Destination IP address
Destination UDP Port	0 to 65535	Destination IP Port Number
Time To Live	0 to 240	TTL value for inclusion in the IP header
Type Of Service	0 to 255	ToS value for inclusion in the IP header

B.2 Control Ethernet Specification

B.2.1 Overview

The system has two Ethernet control ports that support IEEE 802.3 100BaseTX and 1000BaseT Ethernet protocols. The Control ports are accessible via RJ-45 connectors on the rear panel of the chassis and support IEEE 802.3u auto-negotiation and parallel detection. Also, the ports support Auto-MDIX.

Table B.2 Control Ethernet Connector

Item	Specification
Connector type	RJ-45 (100/1000BaseT)
Connector designation	Ctrl 1/2
Pin outs (Unused pins are not connected)	Pin 1 - Rx/Tx A(+) Pin 2 - Rx/Tx A (-) Pin 3 - Rx/Tx B (+) Pin 4 - Rx/Tx C (+) Pin 5 - Rx/Tx C (-) Pin 6 - Rx/Tx B (-) Pin 7 - Rx/Tx D (+) Pin 8 - Rx/Tx D (-)

B.2.2 IP Parameters

It is possible to configure the following IP parameters for the Control Port.

Table B.3 IP Parameters (Control Port)

Parameter	Specification
IP Address	xxx.xxx.xxx.xxx (Ipv4)
Network Mask	xxx.xxx.xxx.xxx (Ipv4)
Gateway Address	xxx.xxx.xxx.xxx (Ipv4)

Note: The front panel always provides a way of changing these settings to prevent all control interfaces being disabled.

B.2.3 MAC Address

The MAC address of each Ethernet Control port can be assigned via the Static Parameters table.

B.3 Data Ethernet Specification

B.3.1 Overview

The Ethernet Data ports support IEEE 802.3u auto-negotiation and parallel detection. The auto-negotiation function can be disabled to force the line speed to be either 100 Mbps or 1000 Mbps.

These ports support Auto-MDIX. This function can be disabled

Table B.4 Data Ethernet Connector

Item	Specification
Connector type	RJ-45 (100/1000BaseT)
Connector designation	Ge 1/2 Ge 3/4
Pin outs (Unused pins are not connected)	Pin 1 - Rx/Tx A(+) Pin 2 - Rx/Tx A (-) Pin 3 - Rx/Tx B (+) Pin 4 - Rx/Tx C (+) Pin 5 - Rx/Tx C (-) Pin 6 - Rx/Tx B (-) Pin 7 - Rx/Tx D (+) Pin 8 - Rx/Tx D (-)

B.3.2 Data Port Parameters

The transport streams output, via the IP Outputs, contains 188 byte long transport stream packets.

The time that a port has had a link established is recorded to an accuracy of ± 1 second, and the information made available to the user.

The Ethernet Data Ports always respond to ICMP Echo requests to any source IP address assigned to an output transport stream currently being transmitted on that port.

The Ethernet Data Ports respond to all ARP requests

There is hardware filtering of received packets (i.e. a hardware 'firewall') to protect the ports from malicious interference.

B.3.3 IP Parameters

It is possible to configure the following IP parameters for the Data Port.

Table B.5 IP Parameters (Data Port)

Parameter	Specification
IP Address	xxx.xxx.xxx.xxx (Ipv4)
Network Mask	xxx.xxx.xxx.xxx (Ipv4)
Gateway Address	xxx.xxx.xxx.xxx (Ipv4)

The default values for source IP address, subnet mask are those assigned to the ethernet port, or in the case of mirrored mode, those assigned to the primary IP port.

B.3.4 MAC Address

The MAC address of each Ethernet Control port can be assigned via the Static Parameters table. It is not possible to set the MAC addresses of each of the Ethernet Data ports to the same value.

B.4 Media Processing Module (SPR/HWO/MPM1)

B.4.1 Overview

The Media Processing Module (MPM) is a single slot solution which can transcode multiple MPEG-2 and/or H.264 video streams, at both SD and HD resolutions. Audio passthrough and transcode functionality is also supported.

The total maximum number of transcodes per module is related to the resolution.

At SD resolution, each MPM1 can perform 12 simultaneous transcodes.

Each transcode involving a HD-resolution stream on input and/or output reduces the number of possible SD transcodes by 3.

Table B.6 Maximum Transcodes

Maximum number of SD-to-SD transcodes	Maximum number of HD transcodes
12	0
9	1
6	2
3	3
0	4

B.4.2 Video Formats

Table B.7 Video Formats

Item	Specification
Profiles supported	MPEG-4 AVC (H.264) Main Profile @ Level 3 to Level 4.1 (0.500 to 12.5 Mbps) MPEG-4 AVC (H.264) High Profile @ Level 4.0 to Level 4.1 (1.000 to 20.0 Mbps) MPEG-2 MP@ML Video (1.000 to 15.0 Mbps) MPEG-2 MP@HL Video (2.000 to 30.0 Mbps)
SD resolutions supported	720 x 576 @ 25 Hz 704 x 576 @ 25 Hz 640 x 576 @ 25 Hz 544 x 576 @ 25 Hz 528 x 576 @ 25 Hz 480 x 576 @ 25 Hz 352 x 576 @ 25 Hz 720 x 480 @ 29.97 Hz 704 x 480 @ 29.97 Hz 640 x 480 @ 29.97 Hz 544 x 480 @ 29.97 Hz 528 x 480 @ 29.97 Hz 480 x 480 @ 29.97 Hz 352 x 480 @ 29.97 Hz
HD resolutions supported	1280 x 720 @ 50 Hz 960 x 720 @ 50 Hz 1920 x 1080 @ 25 Hz

Item	Specification
	1440 x 1080 @ 25 Hz 1280 x 1080 @ 25 Hz 1280 x 720 @ 59.94 Hz 960 x 720 @ 59.94 Hz 1920 x 1080 @ 29.97 Hz 1440 x 1080 @ 29.97 Hz 1280 x 1080 @ 29.97 Hz 1920 x 1080 @ 23.976 Hz
Video PIP formats	MSTV 128 x 96 @ 25 Hz 128 x 96 @ 29.97 Hz 96 x 96 @ 25 Hz 96 x 96 @ 29.97 Hz non-MSTV 192 x 192 @ 25 Hz 192 x 192 @ 29.97 Hz 144 x 144 @ 25 Hz 144 x 144 @ 29.97 Hz
Audio formats	Supported audio decoding and encoding modes: - MPEG-1 Layer II (32 kbps to 384 kbps) - MPEG-2 Layer II (32 kbps to 384 kbps) - Dolby Digital 2.0, 5.1 (56 kbps to 640 kbps) - MPEG-4 AAC/AAC-LC/HE-AAC (16-256kbps)
Audio transcoding	The MPM supports transcoding between any of the supported formats. The maximum number of simultaneous transcodes per card is summarized in <i>Chapter 6, Stream Processing & Networking</i> .
VBI pass-through	In addition to Audio and Video Transcoding, data may be passed through from Input to Output. Typically, this can include : Generic VANC carriage (SMPTE 2038) VBI in PID Teletext DVB Subtitles AFD
SCTE 35 splice-point pass-through	The MPM supports SCTE 35 pass-through. SCTE 35 may be added to any output stream by dragging the component to the appropriate stream in the Services Configuration page. The video will have the appropriate splice-points re-inserted at the right points on transcode.

B.5 Environmental

B.5.1 Conditions

Table B.8 Environmental Conditions

Operational	Specification
Temperature	–10°C to +50°C (14°F to 122°F) ambient with free air-flow. It may require a 10 minute warm-up period before all clocks are within specification if the ambient temperature is less than 0°C
Humidity	0% to 95% (non-condensing)
Cooling requirements	Cool air input from left side of unit, exhaust from right side of unit.
Handling movement	Fixed (non-mobile) use only
Transportation (Packaged)	
Temperature	–40°C to +70°C (–40°F to +158°F)
Humidity	0% to 95% (non-condensing)
Storage	
Temperature	–25°C to +70°C (–13°F to +158°F)
Humidity	0% to 95% (non-condensing)

The product requires no special handling or packaging other than normal procedures for Ericsson equipment and is suitable for lifting by one person.

B.5.2 Physical

Table B.9 Physical Parameters

Parameter	Specification
Height	44.5 mm chassis
Width	442.5 mm (excluding rack fixing brackets) 482.6 mm (including rack fixing brackets)
Depth	550 mm (excluding rear connector clearance)
Rack mounting standard	1U x 19-inch (1U ≡ 44.45 mm)
Weight	7.5 kg (16.5 lbs)

B.6 Power Supply

B.6.1 AC Mains Input

This equipment is fitted with a wide-ranging power supply. It is suitable for supply voltages of 100-240 V AC -10% +6% at 50/60 Hz nominal.

Table B.10 AC Power Supply Specification

Item	Specification
Power distribution system	Type TN ONLY (EN 60950-1 Annex V): Power distribution system which is directly earthed, the parts of the equipment required to be earthed being connected by protective earthing conductors. This equipment must NOT be used with single-phase three-wire and PE, TT or IT Type Power distribution systems.
Connection to supply	Pluggable Equipment Type A (EN 60950-1 para 1.2.5): Equipment which is intended for connection to the building power supply wiring via a non-industrial plug and socket-outlet or a non-industrial appliance Coupler or both. Correct mains polarity must always be observed. Do not use reversible plugs with this equipment.
Class of equipment	Class I Equipment (EN 60950-1 para 1.2.4): electric shock protection by basic insulation and protective earth.
Rated voltage	100-240 V AC (single phase)
Voltage selection	Wide-ranging
Rated frequency	50-60 Hz
Operating Frequency	48-63 Hz
Rated current	4.0 – 2.0 A
Input connector	CEE 22/IEC 3-pin male receptacle
Fuse	Fuse in live conductor in power input filter at rear of unit. Do not use reversible plugs with this equipment.
Fuse type	Bussmann S505 Littelfuse 215 5x20 mm time delay (T) 1500 A breaking capacity (HBC) IEC/EN 60127-2 Sheet 5
Fuse current rating	5 A 250 V T HBC
Power consumption	40 – 350 W (depending on options fitted)

B.6.2 DC Input

This equipment is suitable for voltages of -40 V to -60 V. Correct polarity **must** be observed.

Table B.11 DC Power Supply Specification

Item	Specification
Rated voltage	For Connection to -48 V supplies only. (PSU input tolerance -40 V DC to -60 V DC). Correct polarity must always be observed.
Rated current	9 A.
DC input connector details	For connection to the 48 V input connector, the following parts from AMP or Molex should be used: AMP Universal MATE-N-LOK Housing: AMP no. 1-480700-0 Female terminal (3 per housing): AMP no. 926901-1 Molex MLX Housing: Molex no. 50-84-1030 Female terminal (3 per housing): Molex no. 02-08-1002.
Power consumption	40 W – 350 W (depending on options fitted).

B.7 Compliance¹

B.7.1 Safety

This equipment has been designed and tested to meet the requirements of the following:

EN 60950-1	European	Information technology equipment - Safety.
IEC 60950-1	International	Information technology equipment - Safety.
UL 60950-1	USA	Information technology equipment - Safety.

¹ The version of the standards shown is that applicable at the time of manufacture.

B.7.2 EMC²

The equipment has been designed and tested to meet the following:

EN 55022 and CISPR22	European International	Emission Standard Limits and methods of measurement of radio frequency interference characteristics of information technology equipment - Class A.
EN 61000-3-2 ³	European	Electromagnetic Compatibility (EMC), Part 3 Limits; Section 2. Limits for harmonic current emissions (equipment input current ≤ 16 A per phase).
EN 61000-3-3 ³	European	Electromagnetic Compatibility (EMC), Part 3. Limits; Section 3. Limitation of voltage fluctuations and flicker in low voltage supply systems for equipment with rated current ≤ 16 A.
EN 55024	European	Information technology equipment - Immunity characteristics - Limits and methods of measurement.
FCC	USA	Conducted and radiated emission limits for a Class A digital device, pursuant to the Code of Federal Regulations (CFR) Title 47-Telecommunications, Part 15: Radio frequency devices, subpart B - Unintentional Radiators.

B.7.3 Telecommunications

If certain Option Modules (telecom interfaces) are fitted, this equipment comes within the scope of the RTTE Directive, 1999/5/EC. Compliance with the applicable essential requirements of this Directive (safety and EMC) are met by conformance with the safety and EMC standards listed above.

B.7.4 CE Marking



The CE mark is affixed to indicate compliance with the following directives:

Low Voltage Directive (LVD): Directive 2006/95/EC of 12 December 2006 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits.

Electromagnetic Compatibility (EMC) Directive: Directive 2004/108/EC of 15 December 2004 on the approximation of the laws of the Member States relating

² The EMC tests were performed with the Technical Earth attached, and configured using recommended cables).

³ Applies only to models of the Product using AC power sources.

to electromagnetic compatibility

Radio and Telecommunications Terminal Equipment Directive (RTTE):
Directive 1999/5/EC of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity. (If fitted with telecom type interface modules).

RoHS Directive: Directive 2011/65/EU of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment

REACH Directive: Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

Packaging and Packaging Waste Directive: Directive 2005/20/EC of 9 March 2005 amending Directive 94/62/EC on packaging and packaging waste

WEEE Directive: This directive is outside the scope of CE marking. Ericsson Television does comply with this directive.

Note: The CE mark was first affixed to this product in 2012.

B.7.5

C-Tick Mark



The C-Tick mark is affixed to denote compliance with the Australian Radiocommunications (Compliance and Labelling – Incidental Emissions) Notice made under s.182 of Radiocommunications Act 1992.

Note: The C-Tick mark was first affixed to this product in 2012.

B.7.6

Packaging Statement

The Stratocell ® or Ethafoam 220 ® polyethylene foam inserts can be easily recycled with other low density polyethylene (LDPE) materials.

B.7.7

Packaging Markings

The symbols printed on the outer carton are described below:



Handle with care.



This way up.



Fragile.



Protect from moisture.



See *B.7.4* for compliance with directives details.



See *B.7.5* for compliance details.



Defines country of origin.



The packaging is reusable per GB 18455-2001.



This symbol guarantees that packaging with this symbol is recyclable and will be accepted by cardboard recyclers.



Recyclable per GB 18455-2001.

B.7.8 Materials Declarations

Ericsson's products are designed and manufactured in keeping with good environmental practise. Our component and materials selection policy prohibits the use of a range of potentially hazardous materials. In addition, we comply with relevant environmental legislation.

B.7.8.1 For the European Union

For products sold into the EU after 1st July 2006, we comply with the EU RoHS Directive. We also comply with the WEEE Directive.

B.7.8.2 For China

For product sold into China after 1st March 2007, we comply with the “Administrative Measure on the Control of Pollution by Electronic Information Products”. In the first stage of this legislation, content of six hazardous materials has to be declared together with a statement of the “Environmentally Friendly Use Period (EFUP)”: the time the product can be used in normal service life without leaking the hazardous materials. Ericsson expects the normal use environment to be in an equipment room at controlled temperatures (around 22°C) with moderate humidity (around 60%) and clean air, near sea level, not subject to vibration or shock.

Where an Ericsson product contains potentially hazardous materials, this is indicated on the product by the appropriate symbol containing the EFUP. For Ericsson products, the hazardous material content is limited to lead (Pb) in some solders. This is extremely stable in normal use and the EFUP is taken as 50 years, by comparison with the EFUP given for Digital Exchange/Switching Platform in equipment in Appendix A of “General Rule of Environment-Friendly Use Period of Electronic Information Products”. This is indicated by the product marking:



It is assumed that while the product is in normal use, any batteries associated with real-time clocks or battery-backed RAM will be replaced at the regular intervals.

The EFUP relates only to the environmental impact of the product in normal use, it does not imply that the product will continue to be supported for 50 years.

B.7.9 Equipment Disposal

B.7.9.1 General

Dispose of this equipment safely at the end of its life. Local codes and/or environmental restrictions may affect its disposal. Regulations, policies and/or environmental restrictions differ throughout the world. Contact your local jurisdiction or local authority for specific advice on disposal.

B.7.9.2 For the European Union



"This product is subject to the EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE) and should not be disposed of as unsorted municipal waste."

B.7.10 Lithium Batteries

The equipment uses the Dallas Semiconductor NVRAM DS1746WP which contains a Dallas DS9034PCX Power Cap Lithium battery. This cell is not a USA Environmental Protection Agency listed hazardous waste. It is fully encapsulated and should not be tampered with.

B.7.11 Recycling

Ericsson Recycling has a process facility that enables customers to return Old and End-of-Life Products for recycling if it is required.

Ericsson provides assistance to customers and recyclers through our Ericsson Recycling Business Portal.

This can be reached at: <https://ebusiness.ericsson.net/>.

To gain access to the Recycling site, you must be set up with a unique login and password.

To request the login, please contact tvtechpubs@ericsson.com, and include the information below:

- First/Last name
- Password request (6 numbers/characters). If you do not include this information one will be created for you.
- Phone
- Location (Country)
- Company
- Work Area (select one of the below)
 - Executive Management
 - Marketing and Sales
 - Planning/Engineering
 - Procurement/Supply
 - Project & Programme
 - Implementation
 - Operations and Maintenance
 - R&D
 - Other



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Audio Coding Standards

Annex C

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C.1 A Brief Introduction to Audio Coding Standards

Where appropriate, the output Transport Stream can be made compliant with ATSC A53(E) ATSC Digital Television Standard and DVB 101-154 v1.7.7.

C.1.1 MPEG

The Moving Pictures Experts Group (MPEG) was formed in 1988 to generate compression techniques for audio and video. In the first version, ISO/IEC 11172-3 MPEG-1 audio, has a selection of two separate algorithms. MPEG-1 Layer I and II were implementations of the MUSICAM algorithm and MPEG-1 Layer III (mp3) was an implementation of the ASPEC algorithm. The algorithms have since been improved and extended with other versions of MPEG.

C.1.2 MPEG-1 Layer I/II

This algorithm is similar to MUSICAM and only really differs in the structure of the frame headers. Layer I is a restricted version of the full algorithm to allow a reduced decoder to be developed. Hence, over time as the processing power of decoders have increased by orders of magnitude, Layer I is no longer used for broadcast.

The algorithm creates 3 frames of 384 samples. Each small frame is divided into sub-bands and these sub-bands can be coded for each frame or for all 3. There is limited ability to allocate bits to different bands and there is no entropy coding of the encoded samples so a relatively high bit rate is required to obtain a reasonable quality.

C.1.3 Dolby Digital

Dolby Digital is an algorithm from Dolby that forms part of both the ATSC and DVB standard for digital broadcasting. It is marketed under the name of Dolby Digital.

The encoder includes a psychoacoustic model to improve the quality. The signal is divided into 32 multiple sub-bands, which correspond to the critical bands of the human ear. The number of bits is fixed for each sub-band but there are additional bits that can be allocated to any sub-band where encoding quality has suffered. Dolby recommends stereo signals may be coded at 192 kbps, and 5.1 at 448 kbps but other rates can be used if required.

The encoders have the ability to encode stereo and equivalent modes, and will also pass through pre-compressed Dolby Digital (both stereo and multi-channel).

When in Dolby Digital Pass-through mode, glitch suppression is supported, where the coding module monitors the encoded bitstream and if the framing structure is incorrect, a valid silence frame or the last good frame is inserted in its place. If this state occurs for more than a second, the encoder signals that the Dolby Digital bitstream is corrupted.



C.1.4 SMPTE 302M: Mapping of AES3 Data into an MPEG-2 Transport Stream

Though not specifically a coding standard, this does define a method of carrying AES3 uncompressed audio streams in an MPEG-2 transport stream. The AES stream can contain non-audio data as well as uncompressed audio. This mechanism can be used to carry Linear PCM audio, or Dolby E data.

C.1.5 Dolby E

Dolby E was developed by Dolby Laboratories. It allows up to 8 channels of Dolby E compressed audio to be distributed over an existing 2 channel digital infrastructure. The compression applied is less than that for consumer codecs (i.e. Dolby Digital), so is better quality and the audio can be decompressed and re-compressed several times. The Dolby E stream can also include metadata and timecode.

Dolby E frame duration is either equal to or double the duration of a video frame. For interlaced formats the duration matches a video frame, but is double the frame duration for progressive formats. This facilitates easier editing of video and audio in the digital domain. Dolby E frames are generally aligned to video frames.



Dolby Metadata Presets

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D.1 Dolby Metadata Presets

Eight Dolby Metadata Presets can be configured.

By default, presets 1 - 4 have the same configuration recommended by Ericsson.

Presets 5 - 8 are by default configured to the Dolby defaults for **Stereo Film**, **Stereo Music**, **Surround Film** and **Surround Music** respectively.

To configure the presets, please navigate through the GUI as follows :

System Tab > Slots > Slot 1 > Audio Module > Dolby Metadata Presets

Then select the desired preset number.

The following table lists the alarm and failure identifiers generated within the MPM1 Transcoder Card.

Note: Navigating away from the main Services Configuration page will lose any changes that have not yet been saved/applied.

All of the parameters in the presets can be changed to the user's requirements. Any of these presets can then be applied to any audio channel encoding audio in the Dolby Digital format. *Table D.1* lists the parameters for each preset.

Table D.1 Preset Parameters

Selected Option	Description
Preset name	Name of the preset (for user information)
Dialogue normalization level	Used by a decoder to determine the level of adjustment required to achieve this set level.
Bitstream mode	Flags the type of service in the bitstream.
Line mode compression profile	Alters the dynamic range for line output.
RF mode compression profile	This alters the dynamic range for RF output. The overall level is raised by 11 dB.
Center mix level	Indicates the downmix level when there is no centre speaker. This is applied to left and right channels only.
Surround mix level	Surround downmix level for the front left and right channels when consumer has no surround speakers.
Dolby Surround mode	Flags if a two channel encoded stream contains information for a Dolby Pro-logic decode (Lt/Rt)
Audio production information exists	This indicates whether the Mixing Level and Room Type parameters exist within the bitstream.
Mixing level	Indicates the acoustic sound pressure level of the dialogue level during the final audio mixing session.

Selected Option	Description
Room type	Type and calibration of the mixing room used for the final audio mixing session.
Copyright flag	Indicates if the material is copyright protected
Original bitstream flag	Indicates if source is the original or a copy
Enable extended bitstream information	Flags if additional information is available for downmixing.
Preferred downmix mode	Indicates if the producer would prefer a Lt/Rt or a Lo/Ro downmix. Can be over-ridden by the decoder.
Lt/Rt center mix level	Indicates the required level reduction of the center channel when mixed with the L& R channels for a Lt/Rt downmix. Similar to 'Center mix level'.
Lt/Rt surround mix level	Indicates the required level reduction of the surround channels when mixed for a Lt/Rt downmix. Similar to Surround mix level'.
Lo/Ro center mix level	Indicates the required level reduction of the center channel when mixed with the L& R channels for a Lo/Ro downmix. When present this replaces the value set for the 'Center mix level'
Lo/Ro surround mix level	Indicates the required level reduction of the center channel when mixed for Lo/Ro downmix. When present this replaces the value set for the 'Surround mix level'.
Dolby Surround EX mode	Flags if the stream has been encoded in 'Surround Ex'. Only used if surround channels are present.
A/D converter type	Indicates type of A/D conversion used.
Digital de-emphasis	To meet the Dolby Digital encoding algorithm specification the audio must not have pre-emphasis applied. If the input signal does have pre-emphasis applied, a de-emphasis filter must be applied prior to encoding.
DC high pass filter enable	Removing the DC component can lead to more efficient encoding, but there is a risk that signals that do not reach 100% PCM may exceed this after filtering and therefore must be clipped.
Bandwidth low-pass filter enable	Remove high frequency signals before encoding. The filter removes frequencies that would not normally be encoded.
Low-frequency effects low pass filter enable	Apply a 120 Hz low pass filter prior to an encode. Should only be switched off if it is known that there are no frequencies above 120 Hz.
Surround attenuation enable	Attenuate surround channels by 3 dB before encoding. Theatrical and consumer mixing rooms use different levels for the surround channels, and this can be used to compensate.
Surround phase shift enable	Apply a phase shift of 90 degrees to the surround channels. This simplifies the decode process for producing a 'Lt/Rt' downmix.



Alarm Lists

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E.1 Alarms

The following table lists the alarm and failure identifiers generated within the SPR1100.

Table E.1 Alarm and Failure Identifiers

Name	ID (Hex)	Description	Source	Default Value	Operation Effect
Over Temperature Warning		Failure to take action may cause permanent damage to the unit. Please check the fans are working correctly, and that the ambient temperature is not excessive.	Module	Minor	No effect on operation, but sort out the reason for warning.
Over Temperature	000C0002	Failure to take action may cause permanent damage to the unit. Please switch off and refer to Customer Support.	Module	Critical	No effect on operation, but if no action taken, complete failure could occur.
Invalid Parameter		Invalid Parameter received by the Video/Audio Module.	Module	Critical	Depending on Parameter, could have a service impact.
Video/Audio Module Error		Video/Audio Module Error. Please see Video Encoder status for a more detailed description of the error.	Module	Critical	Depending on Error, could have a service impact.
Power On Self Test Failure		At least one start-up test has failed. Problems may be experienced with the normal operation of the unit.	Module	Critical	Depending on failure, could have a service impact.
Internal HW Information	000C0007	HW reported an unexpected status value. This does not effect normal operation of the unit.	Module	Minor	No effect on operation, but sort out the reason for error.
Option Card Build Version Mismatch	000C0008	The software on this option card is not an officially released version.	Module	Minor	Unit may operate correctly but has an invalid build in. Should be replaced with a valid build as soon as possible (unless a debug build).

Name	ID (Hex)	Description	Source	Default Value	Operation Effect
Video Processor Boot Failure	000C0100	At least one video processor has not booted.	Video Module	Critical	Operational problem on particular service possible with no output. Possibly HW issue. Should try swapping cards.
Video Processor Alive Count Failure	000C0101	At least one video processor has not incremented its alive count.	Video Module	Major	Usually processor has reset due incoming corruption/discontinuity. Brief interruption.
Reflex Operation Compromised	000C0102	Unexpected scenario. Some video components will be stuck at a low bit rate.	Module	Major	This should not happen in normal operation. Unit should be rebooted to recover. If the alarm persists, contact Customer Support.
Video (n) Input Lock	000C0111 - 000C01C1	No valid video found on video input.	Video Module	Major	Service is affected – the unit cannot find any valid video or has corrupted video. However certain corruption may allow some video to be decoded.
Video (n) Input Mismatch	000C0112 - 000C01C2	Unexpected video input format detected	Video Module	Major	Service affected – wrong video format detected compared to configuration for this service.
Video (n) Input Quality	000C0114 - 000C01C3	Too many CC errors or bad packets.	Video Module	Major	Possibly service affected – depending on the frequency of the errors – may have interrupted video.
Video (n) Input PCR	000C0114 - 000C01C4	No or bad PCR detected in input.	Video Module	Major	Possibly service affected – depending on the frequency of the errors – may have interrupted video.
Video (n) SCTE35	000C0115 - 000C01C5	No or bad SCTE35 splice pkt stream.	Video Module	major	No effect on video – error on SCTE35 stream.
Video (n) Conversion	000C0116 - 000C01C6	Requested decode encode combination not supported.	Video Module	Major	No output and this service.
Audio Module Error	000C0300	The audio module reported an unexpected status value.	Audio Module	Minor	Should have no effect on service. Should recover. If persists contact customer service.

Name	ID (Hex)	Description	Source	Default Value	Operation Effect
Audio Module CPU loading	000C0301	The audio module CPU load is too high to support the current audio configuration.	Audio Module	Major	Will not start audio services as configuration is incorrect.
Audio DSP Failed to Boot	000C0302	The audio DSP has failed to boot.	Audio Module	Major	Audio Services will not start and audio will fail.
Option Card Build Version Mismatch		The software on this option card is not an officially released version.	Module	Minor	Unit may operate correctly but has an invalid build in. Should be replaced with a valid build as soon as possible (unless a debug build).
Video Processor Boot Failure		At least one video processor has not booted.	Video Module	Critical	Operational problem on particular service possible with no output. Possibly HW issue. Should try swapping cards.
Video Processor Alive Count Failure		At least one video processor has not incremented its alive count.	Video Module	Major	Usually processor has reset due incoming corruption/discontinuity. Brief interruption.
Video (n) Input Lock		No valid video found on video input.	Video Module	Major	Service is affected – the unit cannot find any valid video or has corrupted video. However, certain corruption may allow some video to be decoded.
Video (n) Input Mismatch		Unexpected video input format detected.	Video Module	Major	Service affected – wrong video format detected compared to configuration for this service.
Video (n) Input Quality		Too many CC errors or bad packets.	Video Module	Major	Possibly service affected – depending on the frequency of the errors – may have interrupted video.
Video (n) Input PCR		No or bad PCR detected in input.	Video Module	Major	Possibly service affected – depending on the frequency of the errors – may have interrupted video.
Video (n) SCTE35		No or bad SCTE35 splice pkt stream.	Video Module	major	No effect on video – error on SCTE35 stream.
Video (n) Conversion		Requested decode encode combination not supported	Video Module	Major	No output and this service.

Name	ID (Hex)	Description	Source	Default Value	Operation Effect
Audio Module Error		The audio module reported an unexpected status value.	Audio Module	Minor	Should have no effect on service. Should recover. If persists contact customer service.
Audio Module CPU loading		The audio module CPU load is too high to support the current audio configuration.	Audio Module	Major	Will not start audio services as configuration is incorrect.
Audio DSP Failed to Boot		The audio DSP has failed to boot.	Audio Module	Major	Audio Services will not start and audio will fail.
Audio (n) Input lock	000C0311 - 000C0481	No valid audio detected on selected input. Please check source connection.	Audio Module	Major	Service will fail because it cannot find any valid audio or has corrupted audio. However, certain corruption may allow some audio to be decoded.
Audio (n) TS input error	000C0312 - 000C0482	Incoming transport stream error. Please check source TS.	Audio Module	Major	Service is usually affected because it has Transport Stream corruption. However, certain corruption may allow some audio to be decoded.
Audio (n) Compressed audio not detected	000C0313 - 000C0483	Compressed audio not detected on input. Please check source connection and source format.	Audio Module	Minor	Service is affected – Compressed audio format not detected in input. Please check source.
Audio (n) Input frame CRC failure	000C0314 - 000C0484	CRC error in compressed input frame. Output is muted.	Audio Module	Minor	Service is affected – Compressed audio format not correct. Please check source.
Audio (n) Unsupported sample rate	000C0315 - 000C0485	Unsupported sample rate at decoder output	Audio Module	Minor	Service is affected – Compressed audio format not correct. Please check source.
Ethernet interface Ctrl 1 link down on Control network	00000401	Ethernet interface Ctrl 1 link down on Control network.	Base Unit	Major	No service effect – but loss of control of unit through this interface.
Ethernet interface Ctrl 1 on Control network: duplicate IP detected		Ethernet interface Ctrl 1 on Control network: duplicate IP detected.	Base Unit	Major	No service effect – but corruption/intermittent control of box through this interface.

Name	ID (Hex)	Description	Source	Default Value	Operation Effect
Ethernet interface Ctrl 2 link down on Control network	00000402	Ethernet interface Ctrl 2 link down on Control network.	Base Unit	Major	No service effect – but loss of control of box through this interface.
Ethernet interface Ctrl 2 on Control network: duplicate IP detected		Ethernet interface Ctrl 2 on Control network: duplicate IP detected.	Base Unit	Major	No service effect – but corruption/intermittent control of box through this interface.
Control Network Lost		Control Network Lost.	Base Unit	Critical	No service effect – but total loss of control of box through all interfaces.
Virtual IP address on Control network: duplicate IP detected		Virtual IP address on Control network: duplicate IP detected.	Base Unit	Major	No service effect – but corruption/intermittent control of box.
Ethernet interface Data 3 link down in Data Interface Group 3-4		Ethernet interface Data 3 link down in Data Interface Group 3-4.	Base Unit	Major	Will affect any service on this data interface.
Ethernet interface Data3 in Data Interface Group 3-4: duplicate IP detected		Ethernet interface Data 3 in Data Interface Group 3-4: duplicate IP detected.	Base Unit	Major	Possible affecting service on this interface– possible corruption/intermittent behavior.
Ethernet interface Data 4 link down in Data Interface Group 3-4		Ethernet interface Data 4 link down in Data Interface Group 3-4.	Base Unit	Major	Will affect any service on this data interface.
Ethernet interface Data 4 in Data Interface Group 3-4: duplicate IP detected		Ethernet interface Data 4 in Data Interface Group 3-4: duplicate IP detected.	Base Unit	Major	Possible affecting service on this interface– possible corruption/intermittent behaviour.

Name	ID (Hex)	Description	Source	Default Value	Operation Effect
Data Interface Group 3-4: Data Output Network Lost		Data Interface Group 3-4: Data Output Network Lost.	Base Unit	Critical	Total loss of data on this interface.
Virtual IP address on Data Interface Group 3-4: duplicate IP detected		Virtual IP address on Data Interface Group 3-4: duplicate IP detected.	Base Unit	Major	Possible affecting service on this interface– possible corruption/intermittent behavior.
Ethernet interface Data 1 link down in Data Interface Group 1-2		Ethernet interface Data 1 link down in Data Interface Group 1-2.	Base Unit	Major	Will affect any service on this data interface.
Ethernet interface Data 1 in Data Interface Group 1-2: duplicate IP detected		Ethernet interface Data 1 in Data Interface Group 1-2: duplicate IP detected.	Base Unit	Major	Possible affecting service on this interface – possible corruption/intermittent behavior.
Ethernet interface Data 2 link down in Data Interface Group 1-2		Ethernet interface Data 2 link down in Data Interface Group 1-2.	Base Unit	Major	Will affect any service on this data interface.
Ethernet interface Data 2 in Data Interface Group 1-2: duplicate IP detected		Ethernet interface Data 2 in Data Interface Group 1-2: duplicate IP detected.	Base Unit	major	Possible affecting service on this interface – possible corruption/intermittent behavior.
Data Interface Group 1-2: Data Input Network Lost		Data Interface Group 1-2: Data Input Network Lost.	Base Unit	Critical	Total loss of data on this interface.
Virtual IP address on Data Interface Group 1-2: duplicate IP detected		Virtual IP address on Data Interface Group 1-2: duplicate IP detected.	Base Unit	Major	Possible affecting service on this interface– possible corruption/intermittent behavior.

Name	ID (Hex)	Description	Source	Default Value	Operation Effect
Primary Ethernet interface not in use on Control Network		Primary Ethernet interface not in use on Control Network.	Base Unit	Major	Should not affect control if secondary being used.
Primary Ethernet interface not in use on Data Interface Group 3-4		Primary Ethernet interface not in use on Data Interface Group 3-4.	Base Unit	Major	Should not affect data output if secondary being used.
Primary Ethernet interface not in use on Data Interface Group 1-2		Primary Ethernet interface not in use on Data Interface Group 1-2.	Base Unit	Major	Should not affect data input if secondary being used.
IP address not assigned to Data 1 in Interface Group 1-2		IP address not assigned to Data1 in Interface Group 1-2.	Base Unit	Critical	IP address needs to be assigned to work correctly.
IP address not assigned to Data 2 in Interface Group 1-2		IP address not assigned to Data2 in Interface Group 1-2.	Base Unit	Critical	IP address needs to be assigned to work correctly.
Source IP address not set for TS being output from Data (n)		No IP address set for physical port Data (n) or user source IP address.	Base Unit	Major	Source address not set for data interface. This should be set if source address required.
Option card failed to boot		The card did not boot. It may be faulty.	Base Unit	Critical	Services on this card will not work
Option Card Comms Failure in slot		An option card failed to respond to the host.	Base Unit	Critical	Option card has never or stopped communication. Services may continue if they were going but any further configuration will fail.
HW Configuration Mismatch in slot		The option card fitted does not match that of the expected configuration. This alarm can be cleared by accepting the config in the Option Slots menu.	Base Unit	Critical	Should be a set up issue – once cleared will not affect operation.

Name	ID (Hex)	Description	Source	Default Value	Operation Effect
Unrecognized Option Card in slot		The id prom of the option could not be read correctly.	Base Unit	Minor	Should not be seen in service. If seen card should operate but needs rectifying.
Referenced Output Stream Unavailable from slot (n)	00000461	An option card is not installed in the specified slot or it cannot provide the requested output stream.	Base Unit	Critical	Any services from this slot will fail.
Fan Failure	00000441	Permanent damage may be caused by running the unit whilst the fans are not working.	Base Unit	Major	Unit will overheat and fail if left in this condition for an extended period.
Over Temperature Warning		Failure to take action may cause permanent damage to the unit. Please check the fans are working correctly, and that the ambient temperature is not excessive.	Base Unit	Minor	Services will continue but the over temperature should be investigated.
Over Temperature	00000443	Failure to take action may cause permanent damage to the unit. Please switch off and refer to Customer Support.	Base Unit	Critical	Unit has overheated and will fail if left in this condition for an extended period.
Power On Self Test Failure		At least one start-up test has failed. Problems may be experienced with the normal operation of the unit.	Base Unit	Minor	A start up test has failed. This may not affect normal operation, but should be investigated.
+12 V A Failed		+12 V A rail has failed. Please check supply or contact Customer Support.	Base Unit	Warning	This may not affect normal operation, but should be investigated.
+12 V B Failed		+12 V A rail has failed. Please check supply or contact Customer Support	Base Unit	Warning	This may not affect normal operation, but should be investigated.
Real Time Clock	0000044B	The Real-time clock has failed. The time/date will not be stored between power-ups	Base Unit	Minor	This will not affect operation but will affect accurate logging, etc.

Name	ID (Hex)	Description	Source	Default Value	Operation Effect
NTP Server Response Timeout		The unit could not contact the NTP Server. The time/date will drift over time.	Base Unit	Warning	Does not affect operation but date and time could be wrong with server.
Internal Hardware Issue	00000449	An Internal Hardware Issue has occurred. The system may not function properly.	Base Unit	Minor	May not affect normal operation but should be investigated.
Host Build Version Mismatch	0000044A	Host software is not at an officially released version. Host function may not be affected.	Base Unit	Minor	Unit may operate correctly but has an invalid build in. Should be replaced with a valid build as soon as possible (unless a debug build).
Host Identity Not Programmed	0000044E	The host identity could not be read correctly.	Base Unit	Major	Unit may operate but has an internal error and should be investigated.
Uncontrolled release	0000044F	This combination of host and option card software is not officially supported. This may lead to unexpected behavior.	Base Unit	Minor	Unit may operate correctly but has an invalid build in. Should be replaced with a valid build as soon as possible (unless a debug build).
No identity license	00000450	This unit has not been licensed with an identity.	Base Unit	Critical	Unit may operate but has an internal error and should be investigated.
Lost Contact With Peer		This unit is not able to contact its redundancy peer. Check that peer IP address is correct, control network connections are correct and that peer working correctly.	Base Unit	Major	The output should be maintained by primary or/and secondary – MGP will stop dual streaming
Unit Unavailable		This unit has been configured to be Unavailable. This means it will not take part in the 1 + 1 redundancy group.	Base unit	Critical	Service will continue but this is a severe warning that 1+1 will not operate if required.

Name	ID (Hex)	Description	Source	Default Value	Operation Effect
Configuration Mismatch		The configuration settings of units in the 1 + 1 redundancy group may not match. To clear this alarm, copy the configuration settings from one unit to the other unit using buttons on the Standalone 1 + 1 Redundancy configuration settings to copy the up-to-date configuration settings to the other unit.	Base Unit	Major	Service will continue but there is a mismatch in configuration and the action listed should be performed.
Redundant Secondary Active		The redundant secondary is active. This will be eroding the timed license on the secondary unit. Repair the primary and switch back to it as soon as possible. To switch back to the primary use the button on the Standalone 1 + 1 Redundancy configuration settings.	Base Unit	Major	Service is maintained but the life of the secondary is time limited (30 days). Warnings will be given before this deadline.
Version Mismatch		The software version, hardware configuration or hardware version of units in the 1 + 1 redundancy group are not identical. The secondary unit will not be able to act as a redundant spare. This alarm will only be raised on a secondary unit, even though the secondary may contain the desired configuration.	Base unit	Major	This should be a set up alarm and should be resolved before a service goes on air.
License Nearly Expired		The 1 + 1 redundancy backup license is close to expiring. If it expires, the secondary unit will not be able to act as a redundant spare. Contact support to renew the license.	Base unit	Critical	Alarm to prompt action that the secondary is running out of time.

Name	ID (Hex)	Description	Source	Default Value	Operation Effect
License Expired		The 1 + 1 redundancy backup license has expired. The secondary unit is not able to act as a redundant spare. The video data outputs of the secondary unit have been disabled. Contact support to renew the license.	Base unit	Critical	The time limit on the secondary unit has expired and the services have been turned off. Renew license and bring primary unit back on line.
Redundancy Parameters Unavailable		The redundancy configuration parameters have not been configured correctly (either on this unit or the peer unit).	Base Unit	Major	This should be a set up alarm. The units are not set up correctly for redundancy – please check.
Conflicting Roles		The primary and secondary Device Roles are in conflict. For a valid redundancy group there must be exactly 1 unit with Primary role and 1 unit with Secondary role. Check the Device Role setting on your primary and secondary units.	Base unit	Major	This should be a set up alarm. The units are not set up correctly for redundancy – please check.
Conflicting IP Addresses		The primary and secondary IP address configurations are in conflict. Ensure that the Peer IP Address setting on each unit is correctly configured with the control IP address of its peer.	Base Unit	Major	This should be a set up alarm. The units are not set up correctly for redundancy – please check.

Name	ID (Hex)	Description	Source	Default Value	Operation Effect
Conflicting Status		The Primary and Secondary Active/Passive status values are in conflict and cannot be resolved automatically. Both units are either Passive or Active. This can occur if power is lost, or the control connection between the units fails. To clear this condition use the Set Primary Active or Set Secondary Active buttons on the Standalone 1 + 1 Redundancy configuration settings.	Base Unit	Critical	An event has occurred that probably interrupted service for a period and now the units need to be reset to a know status.
No data available for Input Transport Stream	00000501 - 0000050A	Both Primary and Backup Input Transport Streams have failed.	Base Unit	Critical	The data on both inputs have failed and will cause a loss of service.
Input Transport Stream running on Backup	00000511 - 0000051A	Primary Input Transport Stream has failed.	Base Unit	Warning	A switch has occurred to back up input. The cause for this should be investigated.
MGP Failure		Failed to go online, previous online device preventing transmission.	Base Unit	Major	Previous device is still on line and MGP has stopped this unit from going on line.
MGP Collision	00000492	Potential duplicate transmission detected.	Base Unit	Major	Service should be maintained but there seems to be inconsistent messaging in the system. Needs to be investigated.
MGP Spurious	00000493	Spurious MSM packet detected.	Base Unit	Minor	Service should not be affected but an unexpected message appeared. If this continues it should be investigated.
Reflex Operation Compromised	00000693	Unexpected scenario. Some video components will be stuck at a low bit rate.	Base Unit	Major	This should not happen in normal operation. Unit should be rebooted to recover. If the alarm persists, contact Customer Support.



Automatic Loudness Control

Annex F

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Automatic Loudness Control

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F.1 Overview

This Annex describes the operation of Automatic Loudness Control (ALC) in the EN81xx encoder version 7.0.100 onwards.

ALC is an audio processing mode for measuring and modifying audio amplitude with the aim of changing the perceived loudness level. It uses a measurement based upon the new standards for measuring audio loudness defined in ITU-R BS.1770-2, this standard forms the measurement basis of the guidelines in EBU R128 and ATSC/A85.

F.1.1 The Challenge Faced Today

Loudness encompasses two issues:

- The first is where the loudness increases when transitioning to an interstitial / advert. Traditional peak measurement methods do not adequately measure the perceived loudness of audio and interstitials / 'adverts' are often produced to take advantage of this. This is addressed by the ALC algorithm. This operates dynamically, responding quickly to sudden increases in loudness and removing correction quickly once the problem has abated.
- The second is the disparity of loudness between different services. This results in differences in loudness when 'surfing' channels and a viewer having to adjust the volume whenever they change to a new channel. The long term correction algorithm (LTLC) should measure the audio input level over a longer period and gradually adjust the level towards the desired loudness level. This operates gradually to make the correction imperceptible to the listener. Setting all channels to the same level will bring them into loudness alignment.

Dynamically correcting loudness issues presents a difficulty due to conflicting needs of maintaining audio quality and making the corrections imperceptible to the listener while still being effective.

Performing correction in a live environment in a broadcast encoder brings its own challenges. Most current recommendations/legislation for audio loudness management describes the measurement of audio loudness in one of two different methods:

- The first method is to measure the loudness over the duration of the program, where the definition of a program could be a 2 hour film or a 30 second advert. The loudness of the material is measured over the entire program, this means that there could be a 30 s period in a film where the audio is very loud (i.e. an action scene with explosions); however, this could be balanced out across the entire program and would be perfectly acceptable. With an advert at a similar loudness this 30 s period has no way of being balanced out and could then violate loudness regulations / recommendations. This is a problem in live environments because the loudness for the program cannot be known ahead of time, similarly in a broadcast encoder it is not known where a program starts and ends. To be absolutely certain of compliance requires the material to be measured and adjusted offline prior to broadcast.

- The second method is to sample the average loudness of a channel at regular intervals and make sure that these lie within the regulated tolerances for loudness. This is easier in a broadcast / live environment as the start and end periods of a program do not need to be known. The encoder tries to dynamically adjust the loudness to keep to the target level. The encoder settings control how dynamically the encoder responds. This is the method that is adopted by audio loudness correction systems operating in a live environment.

In a broadcast / live environment there is always going to be a problem of knowing when to correct an excess of loudness and when it should be allowed because it is part of a dynamic program which is correctly formatted for the regulations when measured as a whole.

F.1.2 Corrective Measures

Ericsson's Automatic Loudness Control has 3 components:

1. Measurement.
2. Short Term Audio Loudness Correction (ALC).
3. Long Term Audio Loudness Correction (LTLC).

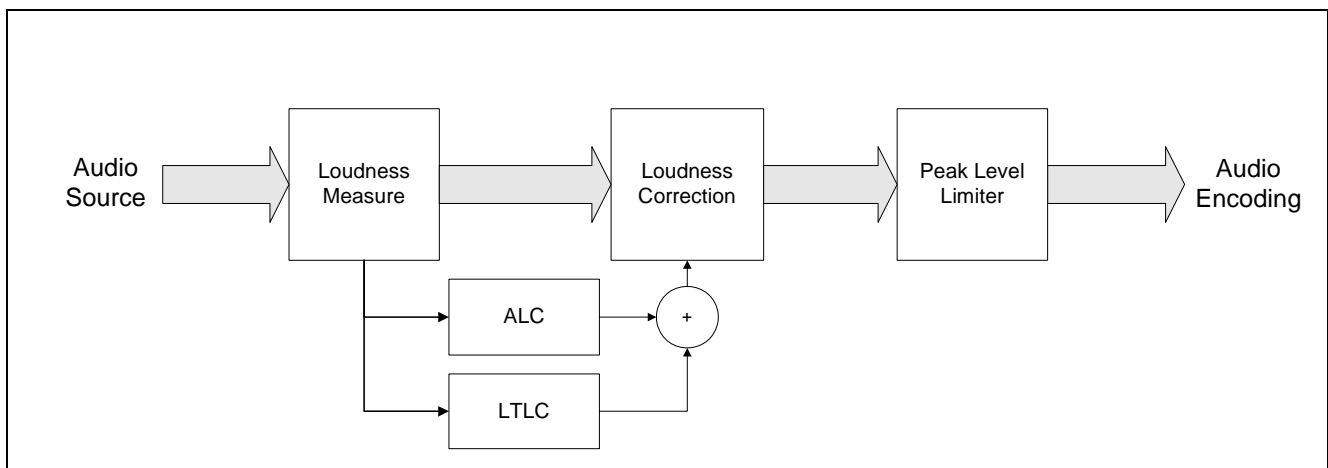


Figure F.1 Corrective Measures

The Measurement stage measures the loudness of the raw audio prior to encoding (and if applicable after an input decode stage). The measurement uses the algorithm defined in ITU-R BS.1770-2. It provides an Integrated Loudness Measurement; this is a long measurement using data collected since the audio channel was configured or since the statistics were last reset. It also provides a short measurement of the loudness of the last three second window. All measurements are made prior to any corrections and any encode process.

The short term audio loudness correction is designed to correct spikes in loudness such as those seen during interstitials / adverts. The response of this algorithm can be controlled using the three available presets. The short term ALC algorithm will never apply gain it will only attenuate the input, this is to avoid impairing intentionally quiet sections of content, something that commonly occurs in movies. The algorithm takes a measurement of loudness over a very short window and operates quickly to correct and then remove correction once the problem has gone. If using only short term ALC mode, for this to operate correctly then the loudness of the incoming audio needs to be at approximately target level.

The long term audio loudness correction is designed to adjust the long term loudness of a channel to the target level. This responds dynamically to the input and the speed of response can be configured by the time period. This setting can be used in a system to attempt to produce channels with equivalent loudness levels so when a user is changing channels they do not perceive different loudness levels.

When transcoding, the measurement stage follows the decoding stage for the incoming audio. All measurements and corrections are made to uncompressed audio and are therefore independent of the choice of audio coding standards.

It is worth noting that although the measurement of audio loudness is specifically defined by the standards mentioned in this document the correction is a result of the interpretation of the specific algorithm. Therefore, two different implementations that are both ITU-R BS.1770-2 compliant will not necessarily produce the same corrective result. It is therefore advised that if the corrected output is to be referenced to any regional legislation that the measurement and any subsequent correction is performed offline rather than on a real-time basis.

F.2 Operation

F.2.1 Loudness Units

LKFS

The ITU has defined a new unit for the measurement of audio loudness based upon ITU-R BS.1770. This defines the designation LKFS, the unit is a perceptually weighted measurement relative to full scale. A property of this unit is a relationship to dBFS such that an increase in the level of a signal by 1 dB will cause an increase in loudness by 1 LKFS.

LU

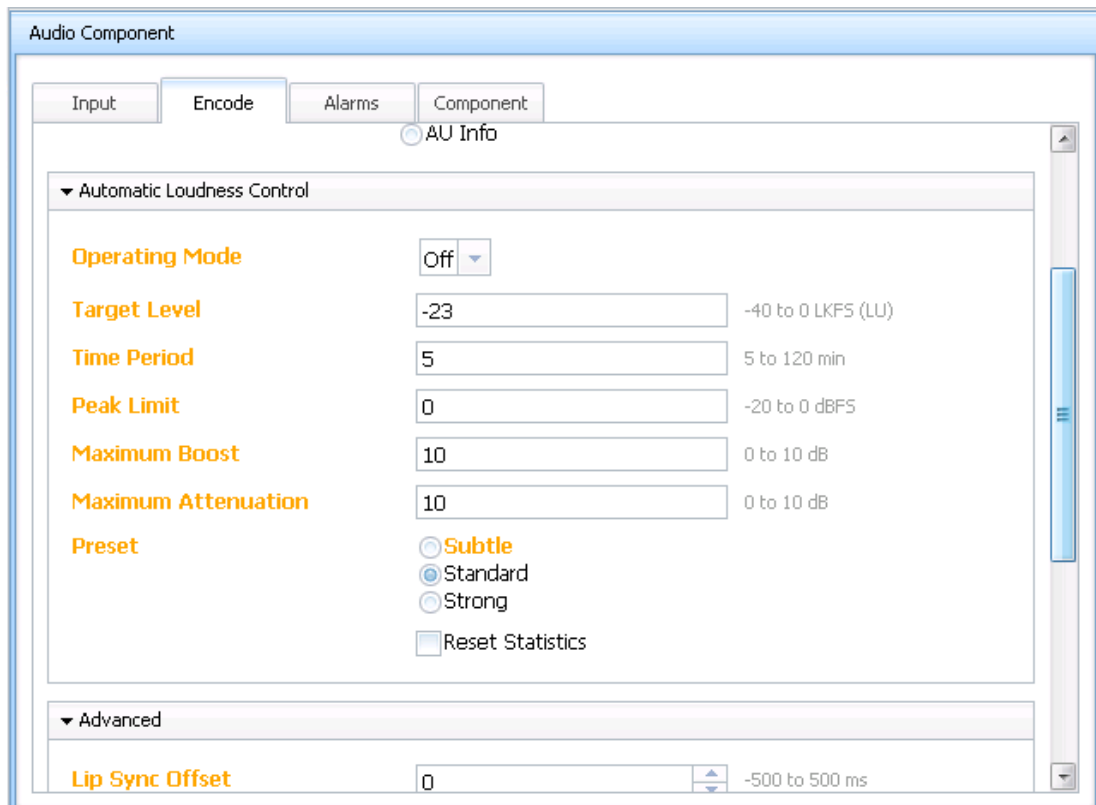
The recommendation ITU-R BS.1771 defines the designation LU (Loudness Unit) which has a one to one correspondence to LKFS.

F.2.2 Configuration

F.2.2.1 Basic Configuration

Make sure the unit has the required number of ALC licenses, one license is required per stereo pair or part of (for details see section *F.4.3 Licensing*). This can be viewed on the **Configuration > Licenses** web page.

To configure ALC from the web interface select the card in use for the audio encoding and then select the appropriate audio module and audio encode instance. On the audio encode menu select the **Automatic Loudness Control** menu, see *Figure F.2* below.



The screenshot shows the 'Audio Component' web interface with the 'Encode' tab selected. Under the 'Automatic Loudness Control' section, the following settings are visible:

- Operating Mode:** A dropdown menu set to 'Off'.
- Target Level:** A text input field containing '-23', with a range of '-40 to 0 LKFS (LU)' indicated to the right.
- Time Period:** A text input field containing '5', with a range of '5 to 120 min' indicated to the right.
- Peak Limit:** A text input field containing '0', with a range of '-20 to 0 dBFS' indicated to the right.
- Maximum Boost:** A text input field containing '10', with a range of '0 to 10 dB' indicated to the right.
- Maximum Attenuation:** A text input field containing '10', with a range of '0 to 10 dB' indicated to the right.
- Preset:** Three radio button options: 'Subtle' (selected), 'Standard', and 'Strong'.
- Reset Statistics:** An unchecked checkbox.

Below the main settings, there is an 'Advanced' section with a 'Lip Sync Offset' text input field set to '0', with a range of '-500 to 500 ms' indicated to the right.

Figure F.2 Audio Component > Encode Tab > Automatic Loudness Control

1. **Configure the operating mode.** For short term only corrections select the **Measure + ALC** option. For short term corrections and longer term channel level adjustment select **Measure + ALC + LTLC**. If using **Measure + ALC**, then for correct operation the nominal level of the incoming audio should be approximately the same as the **Target Level**.
2. **Set the Target Level.** This should normally be the regulation prescribed loudness level. This is the desired loudness level for the long term level adjustment. The EBU recommendation as found in EBU R128 is -23 LU. The ATSC recommendation as found in ATSC/A85 is -24 LKFS.
3. **Select the Time Period,** this is the response time for the adjustments of the long term level correction. 20 minutes would be a suitable starting value, if the

changes are too dynamic then increase this number. Remember to leave enough time after this has been changed for the response to take place as this could be quite gradual.

4. **Leave all the other values on their default settings.** If the algorithm is not correcting advert levels adequately then try changing the preset to **strong**, if the effect is too strong on adverts then set the preset to **subtle**.

See *F.2.2.3 Menu Settings* for details of each menu item.

F.2.2.2 Advanced Configuration

The ALC algorithm fits in the audio pipeline immediately before the encode algorithm. When transcoding, the ALC operates after the decode stage.

Section *F.3 The Audio Pipeline* describes the ALC pipeline in detail and shows the order in which adjustments are applied.

To begin with, follow section *F.2.2.1 Basic Configuration*.

The time period controls the response of the long term correction algorithm, the time period refers to the amount of time taken by the filter to achieve 2/3 of the correction needed. The speed of the correction is controlled by 2 factors, this is one of them, this value controls the response curve of the filter as the error between the current level and the desired level reduces so does the rate of change of correction so as to avoid overshoot and oscillation. The second factor is an internal rule that prevents changes occurring too quickly to avoid noticeable changes.

Additional Controls

The **Peak Limit** is a hard limit (it will clip the signal) on the maximum signal level in dB; this does not use the loudness measurements. The limiter is after the loudness measurement and correction.

Maximum Boost and **Maximum Attenuation**, these control how much adjustment can be applied by the loudness correction algorithm. This is to prevent over adjustment which can lead to unwanted audio artifacts.

F.2.2.3 Menu Settings

All the corrections are based upon the measurement compared to the target level which should be configured to the local regulated loudness level.

- **Operating Mode** - the ALC operating mode:
 - **Off** - ALC is not in use.
 - **Measure** - Long and short measurements are taken and displayed in the status but no audio adjustments are made.
 - **Measure + ALC** - Measurements are taken and corrections are made for short term peak in audio that are measured 1 LU above the target level.



- **Measure + ALC + LTLC** - Measurements are taken and corrections are made for short term peak in audio that are measured 1 LU above the target level. Corrections are also made over the longer term to adjust the channel loudness level to that of the target level.

Note: In this mode manual gain adjustment from the codec page is disabled.

- **Target Level** - The desired loudness level for the channel. This should normally be set to the level specified by local legislation for the expected audio loudness level.
- **Timer Period** - This controls the responsiveness of the long term audio loudness level correction. A smaller number will result in the audio being adjusted more dynamically. A larger value will give a slower less noticeable adjustment. If the response is increased then the level will change more frequently. This can result in reducing the dynamics of the audio material. A slower response will have less effect on the audio however if the input level changes then the audio level will take longer to adjust to the target level. This is a balance between the two factors that needs to be decided upon by the operator.
- **Peak Limit** - This controls a hard clipping limiter for the audio level. This adjustment is based on the absolute peak level measured in dBFS. The peak limiter only operates in **Measure + ALC** and **Measure + ALC + LTLC** modes. If this value is set to 0, no limiting is performed.
- **Maximum Boost** - This control determines the maximum amount of gain that the LTLC algorithm can apply. This is to prevent over adjustment which can lead to unwanted audio artifacts.
- **Maximum Attenuation** - This control determines the maximum amount of attenuation that the ALC and the LTLC algorithm can apply. This is to prevent over adjustment which can lead to unwanted audio artifacts.
- **Preset** - The available options are **Subtle**, **Standard** and **Strong**. This setting controls the aggressiveness of the corrections performed by the Short Term ALC algorithm. It controls how quickly the correction takes place and the strength of the correction

F.2.2.4

Status Values

- **Integrated Loudness** - This is the long term measurement that shows the channel loudness since configuration or the last reset request. After running for a period of time this could be expected to show little response but will show the long average loudness for the channel. **This displays the input level before any correction is applied.**
- **Short Term Loudness** - This is the short term measurement that shows the loudness of the channel measured over the last 3 seconds. **This displays the input level before any correction is applied.**
- **Current Adjustment** - This is the current correction that the ALC and LTLC algorithms are applying to the audio. This changes slowly due to the nature of

the web interface. Internally the correction calculations are being performed every audio frame.

- **Reset Statistics** - This can be used to reset the statistics that have been collected in the audio DSP. Due to the slower update nature of the web interface the apparent change would be to the measurement of the Integrated Loudness only.

F.3 The Audio Pipeline

Figure F.3 shows how the different components of ALC fit together in the audio pipeline. The figure shows which user interface settings control each block.

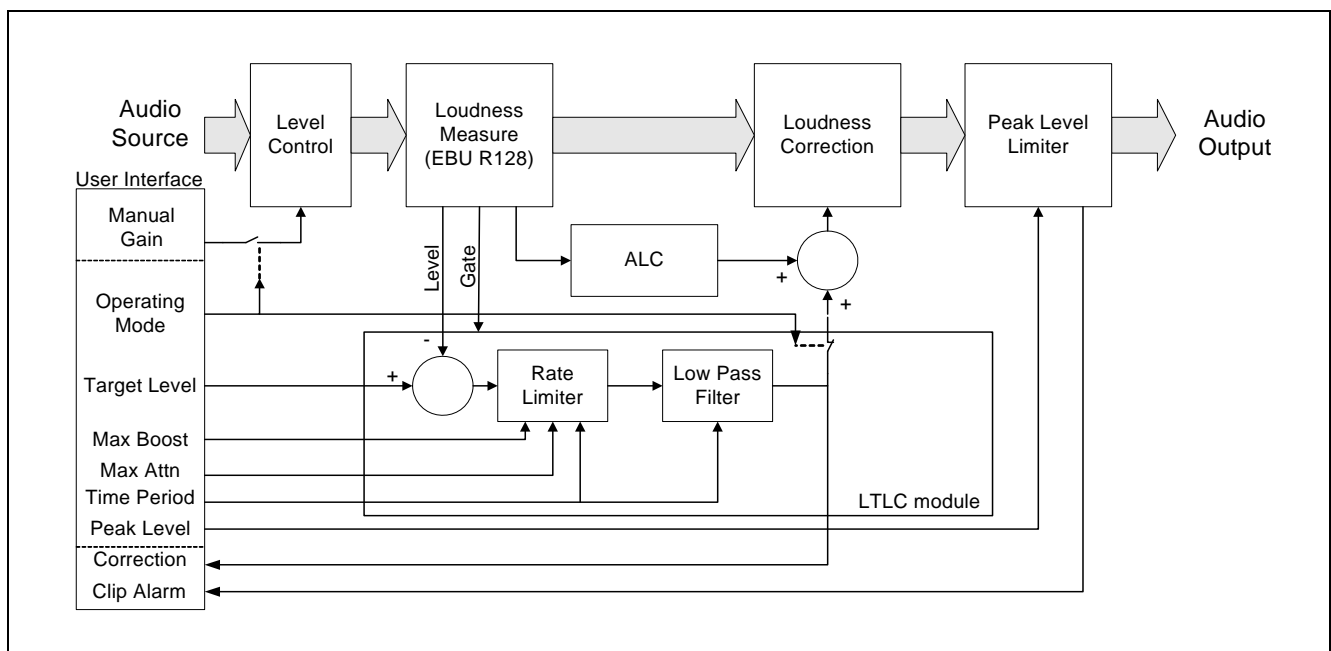


Figure F.3 ALC Components

The pipeline takes, as its source, the raw audio input or output of the decode stage. The output goes to actual encode library.

The (manual) Level Control stage is disabled when ALC is in operation. The Loudness Measure block performs a standards-based (EBU R128) measurement algorithm on the audio signal. The statistics collected here are then passed to the LTLC module and the ALC module.

The LTLC module uses an over-damped feed-forward control loop.

The LTLC module and the ALC module both calculate the necessary corrections. The rate limiter in the LTLC module prevents the adjustments from making large gain/attenuation changes too quickly. The adjustment factors, due to LTLC and ALC, are then combined and the Loudness Correction block takes in one adjustment factor so that the audio is manipulated only once.



The final stage is to pass the audio through a Peak Level Limiter to clip levels that are too high.

F.4 Standards Compliance

F.4.1 Measurement

The measurements made follow those specified in ITU-R BS.1770-2. This defines the unit LKFS. The measurement does not perform the True Peak measurement defined in ITU-R BS.1770-2.

The interface also uses the unit LU which is defined in ITU-R BS.1771.

EBU R128 defines a short loudness measurement which is used as a basis for the provided Short Term measurement but due to the nature of the web interface the Short Term value cannot be updated as frequently as that defined in the EBU recommendation.

ATSC Recommended Practice A/85 Annex A Section 5.1 specifies the use of ITU-R BS.1770 as a method of measuring audio loudness.

The measurement has been verified against third party measurement equipment that implement an ITU-R BS.1770-2 measure.

F.4.2 Correction

There is no standard algorithm for correcting audio loudness problems. The algorithms used in ALC and LTLC are proprietary and copyrighted by Ericsson Television.

F.4.3 Licensing

ALC is a licensed feature. It requires a license for every encode instance of stereo or mono.

For multichannel encoding 1 license allows for 2 channels and a license cannot be split across multiple encode instances.

Examples:

- 2.0 (Stereo) requires 1 license.
- 1.0 (Mono) requires 1 license.
- 1+1 (Dual Mono) requires 1 license.
- 2 x 1.0 requires 2 licenses.
- 5.1 counts as 6 channels and therefore requires 3 licenses.

- 5.0 counts as 5 channels and therefore requires 3 licenses.

For 2 5.0 services, this requires 2 encode instances and each instance requires 3 licenses. In total 6 licenses.

The ALC license is in addition to any other required audio licenses.

F.4.4

Further Information

- Recommendation ITU-R BS 1770-2 'Algorithms to measure audio programme loudness and true-peak audio level'
- Recommendation ITU-R BS.1771, 'Requirements for loudness and true-peak indicating meters'
- EBU Working Group PLOUD <http://tech.ebu.ch/loudness>
- EBU Technical Recommendation R 128 'Loudness normalisation and permitted maximum level of audio signals'
- EBU Tech Doc 3341 'Loudness Metering: 'EBU Mode' metering to supplement loudness normalisation in accordance with EBU R 128'
- EBU Tech Doc 3342 'Loudness Range: A measure to supplement loudness normalisation in accordance with EBU R 128'
- EBU Tech Doc 3343 'Practical Guidelines for Production and implementation in accordance with EBU R 128'
- EBU Tech Doc 3344 'Practical Guidelines for Distribution of Programmes in accordance with EBU R 128'
- ATSC Recommended Practice: 'Techniques for Establishing and Maintaining
- Audio Loudness for Digital Television Document' A/85:2011, 25 July 2011



Automatic Loudness Control

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